VOLUME XLV

NUMBER THREE

THE NATIONAL GEOGRAPHIC MAGAZINE

MARCH, 1924

CONTENTS

Geography and Some Explorers
With 13 Illustrations — JOSEPH CONRAD

The Lure of the Land of Ice
16 Full-Page Illustrations — HERBERT G. PONTING

Beyond the Clay Hills
With 29 Illustrations — NEIL M. JUDD

Among the "Craters of the Moon"
With 24 Illustrations — R. W. LIMBERT

Australia's Wild Wonderland
With 37 Illustrations — M. P. GREENWOOD ADAMS

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
HUBBARD MEMORIAL HALL
WASHINGTON, D.C.

$3.50 A YEAR

50c. THE COPY

XUM

NATIONAL GEOGRAPHIC SOCIETY

GEOGRAPHIC ADMINISTRATION BUILDINGS
SIXTEENTH AND M STREETS NORTHWEST, WASHINGTON, D. C.

GILBERT GROSVENOR, President
JOHN OLIVER LA GORCE, Vice-President
JOHN JOY EDSON, Treasurer
BOYD TAYLOR, Assistant Treasurer
HENRY WHITE, Vice-President
O. P. AUSTIN, Secretary
GEO. W. HUTCHISON, Associate Secretary
EDWIN P. GROSVENOR, General Counsel
FREDERICK V. COVILLE, Chairman Committee on Research

EXECUTIVE STAFF OF THE NATIONAL GEOGRAPHIC MAGAZINE

GILBERT GROSVENOR, EDITOR

JOHN OLIVER LA GORCE, Associate Editor
WILLIAM J. SHOWALTER
Assistant Editor
RALPH A. GRAVES
Assistant Editor
FRANKLIN L. FISHER
Chief of Illustrations Division
J. R. HILDEBRAND, Chief of School Service

BOARD OF TRUSTEES

CHARLES J. BELL
President American Security and Trust Company

JOHN JOY EDSON
Chairman of the Board, Washington Loan & Trust Company

DAVID FAIRCHILD
In Charge of Agricultural Explorations, U. S. Department of Agriculture.

C. HART MERRIAM
Member National Academy of Sciences

O. P. AUSTIN
Statistician

GEORGE R. PUTNAM
Commissioner U. S. Bureau of Lighthouses

GEORGE SHIRAS, 3D
Formerly Member U. S. Congress, Faunal Naturalist, and Wild-game Photographer

E. LESTER JONES
Director U. S. Coast and Geodetic Survey

WILLIAM HOWARD TAFT
Chief Justice of the United States

GRANT SQUIRES
Military Intelligence Division, General Staff, New York

C. M. CHESTER
Rear Admiral U. S. Navy, Formerly Supt. U. S. Naval Observatory

FREDERICK V. COVILLE
Botanist, U. S. Department of Agriculture

RUDOLPH KAUFFMANN
Managing Editor The Evening Star

T. L. MACDONALD
M. D., F. A. C. S.

S. N. D. NORTH
Formerly Director U. S. Bureau of Census

JOHN OLIVER LA GORCE
Associate Editor National Geographic Magazine

JOHN BARTON PAYNE
Chairman American Red Cross

J. HOWARD GORE
Prof. Emeritus Mathematics, The George Washington University

A. W. GREELY
Arctic Explorer, Major General U. S. Army

GILBERT GROSVENOR
Editor of National Geographic Magazine

GEORGE OTIS SMITH
Director U. S. Geological Survey

O. H. TITTMANN
Formerly Superintendent U. S. Coast and Geodetic Survey

HENRY WHITE
Member American Peace Commission, Formerly U. S. Ambassador to France, Italy, etc.

STEPHEN T. MATHER
Director National Park Service

ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

TO carry out the purposes for which it was founded thirty-six years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resultant given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

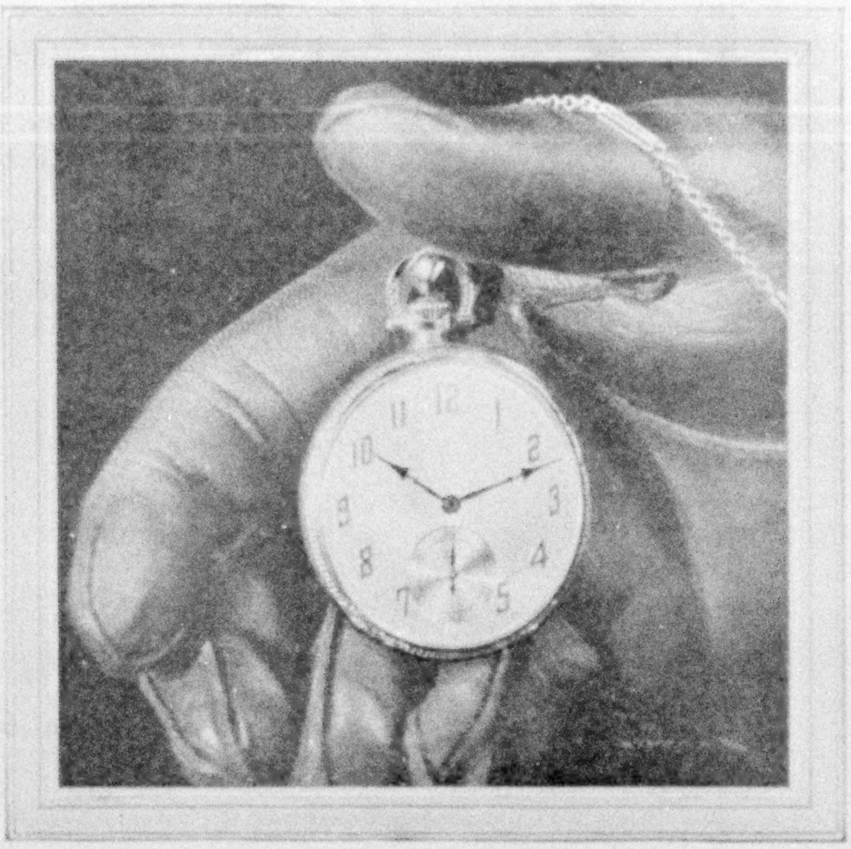
THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purchase was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

THE Society also is maintaining expeditions in the unknown area adjacent to the San Juan River in southeastern Utah, and in Yunnan, Kweichow, and Kansu, China—all regions virgin to scientific study.

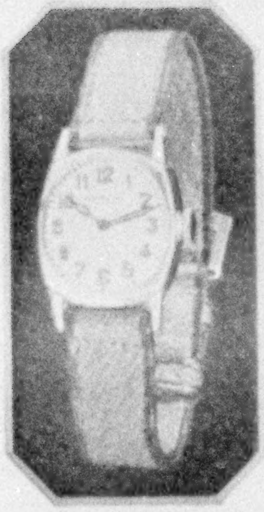
Copyright, 1924, by National Geographic Society, Washington, D. C., in the United States and Great Britain. All rights reserved. Entered at the Post Office at Washington, D. C., as Second-Class Mail Matter. Acceptance for mailing at special rate of postage provided for in Sec. 1103, Act of October 3, 1917, authorized July 1, 1918.



Hamilton Watches are shown in 14K and filled green gold or white gold, plain or engraved, $46—$250. You can choose from a wide variety of cases and dials.

ACCURACY

the greatest thing a watch can have



Men's strap watches at $50 and $75. Women's wrist watches, $46—$75.

MOST of the people who wear Hamilton Watches today chose them because of their reputation for railroad accuracy. The accuracy of the Hamilton ranks it among the finest watches in the world.

Hamilton materials, Hamilton workmanship, and Hamilton sincerity have produced an extraordinary timekeeper.

The new models possess a beauty that many consider perfection in watch designing. It is a conservative beauty that will be consistently fashionable after years of service.

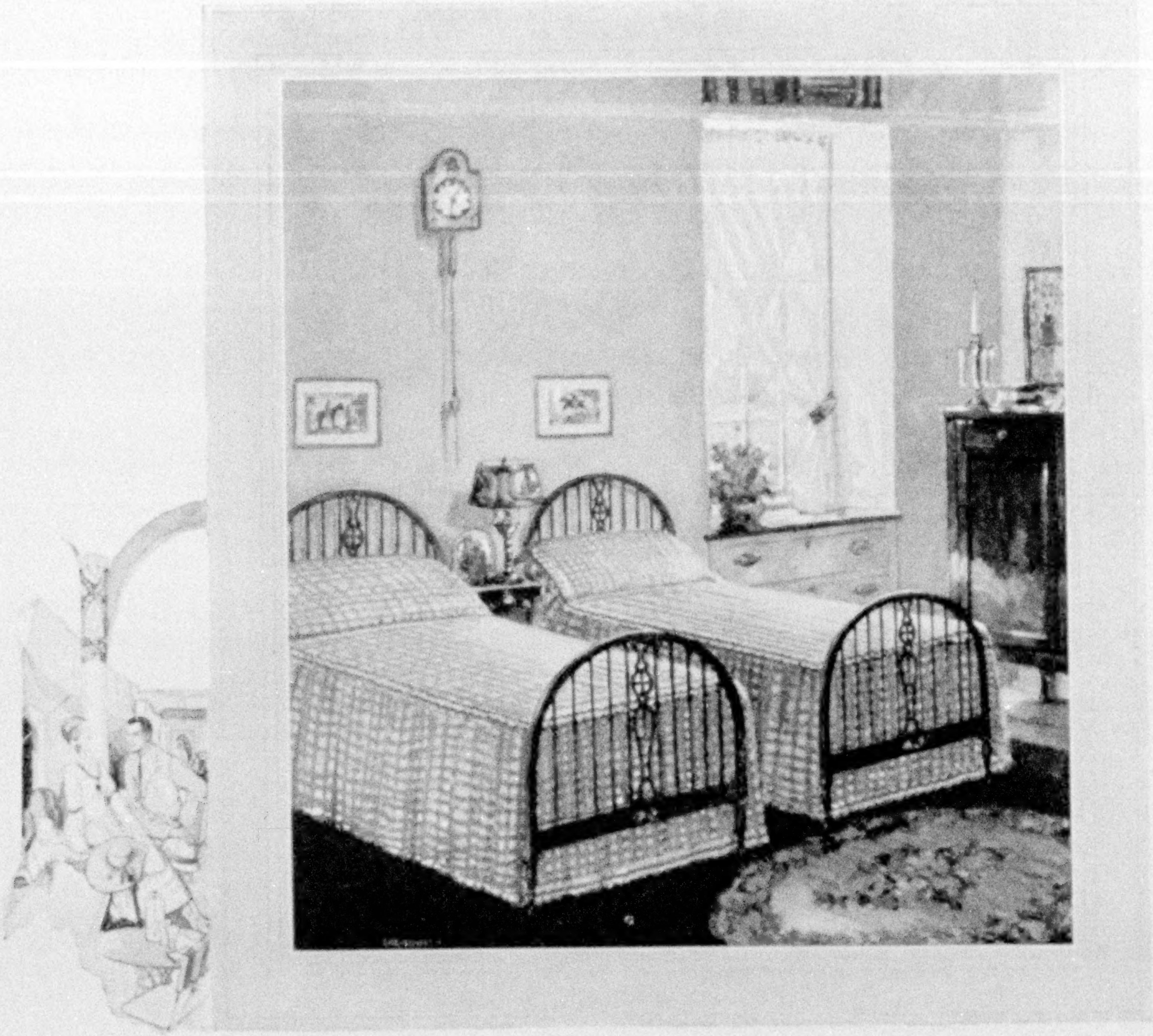
These two things—accuracy and beauty—are so well combined in a Hamilton that it is considered matchless by the country's best jewelers.

HAMILTON WATCH COMPANY, *Lancaster, Pa.*, U. S. A.

Send for a copy of our new illustrated booklet, "The Timekeeper"

Hamilton Watch

The Watch of Railroad Accuracy



You pay the price of sound sleep. What kind do you get?

The money that you invest in sleep equipment is the smallest part of what sleep costs you.

Time is the big thing. For every hour of work or play, we all pay thirty minutes each night in sleep. And for this third of life spent in bed, most of us get less real rest than we should. Poor bedding cheats us.

Yet rest is life's great need. If nightly you lose even an hour of the deep, unbroken sleep you require, your health suffers, your energy flags, your success fades.

Spare a few minutes tonight to examine the bed you sleep on. Compare it, at a dealer's, with the Simmons springs and mattresses he offers in many types—each at the lowest price it can be built of *safe, new materials.* Then decide whether you can afford to wait even another night to enjoy Simmons sleep equipment.

Colonial in all its essentials, color lends charm to this very livable chamber. Bedspreads are of deep rose gingham, the tops and flounces edged with serpentine braid. Midnight blue Wilton carpet. Golden brown painted floor. Oval hooked rug in a pattern of old-fashioned roses. Rough plaster walls in warm gray. Curtains of net, swiss or muslin. Colonial painted clock. Lamp of the same period, with spiral green glass base and painted shade. Chifforobe, table and Windsor beds, No. 1830, are from a complete new suite of Simmons furniture, early American in spirit, the finish faithfully reproducing the beauty of walnut. For nine similar schemes of chamber decoration, write for "Restful Bedrooms" to The Simmons Company, 1347 South Michigan Ave., Chicago, or to Simmons Limited, 400 St. Ambroise Street, Montreal, Que.

SIMMONS COMPANY
TRADE MARK

LOOK FOR THE
SIMMONS
LABEL

SIMMONS

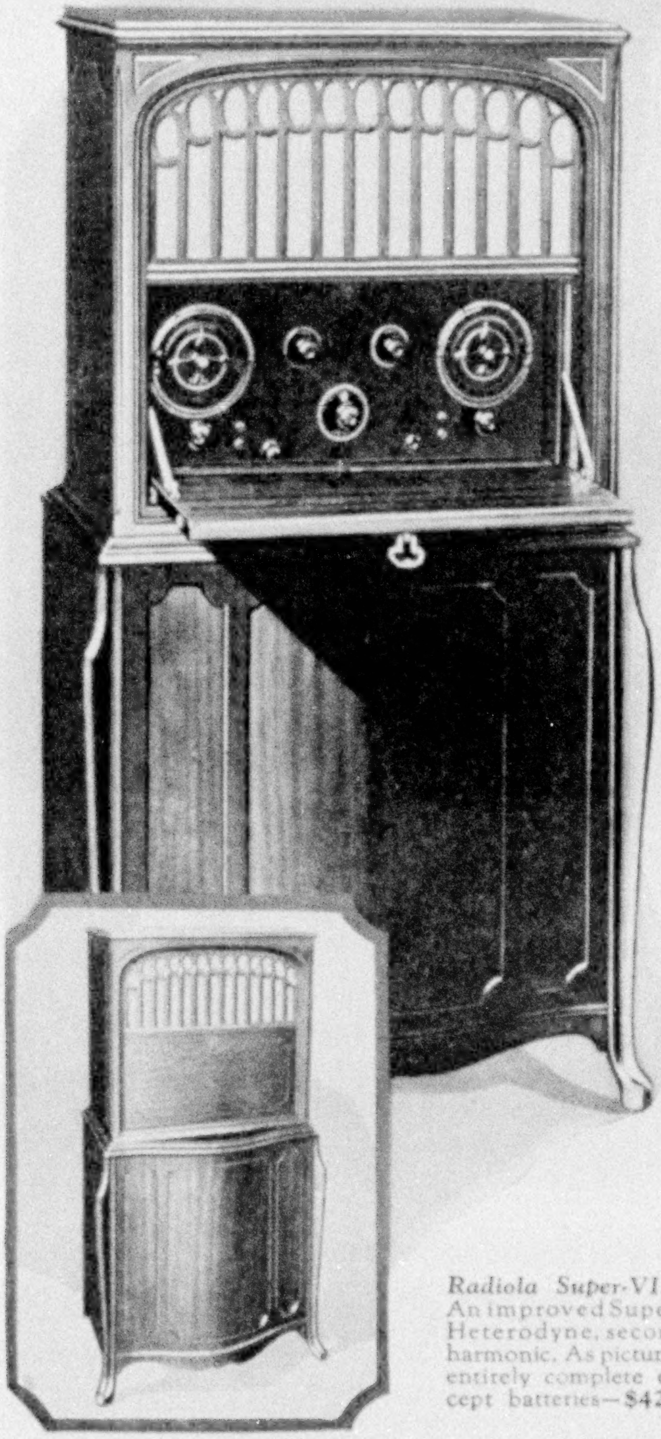
Beds · Mattresses · Springs: Built for Sleep
and BEDROOM FURNITURE

Radiola Super-VIII

IT is a richly cabineted instrument that stands aloof and beautiful. Without antenna, without ground connection, it brings in music and speech from faraway cities, through its hidden loudspeaker.

It is supremely selective—yet it has but two knobs to turn. You can mark, once and for all, the location of each station on the dial, and any novice can instantly pick up distant stations—get them loud and clear—without interference. With voice as distinct and perfect as the spoken word. With music mellow and beautiful in tone.

It fulfills a prophecy of possible radio achievement—far sooner than the world expected.



Radiola Super-VIII. An improved Super-Heterodyne, second harmonic. As pictured entirely complete except batteries—$425.

Radio Corporation of America
Sales Department
233 Broadway, New York
10 So. La Salle St., Chicago, Ill.
433 California St., San Francisco, Cal.

Send for the free booklet that describes every Radiola

RCA

This symbol of quality is your protection

Radiola

REG. U. S. PAT. OFF.

Radio Corporation of America.
Dept. 353. (Address office nearest you.) Please send me your free Radio Booklet.

Name

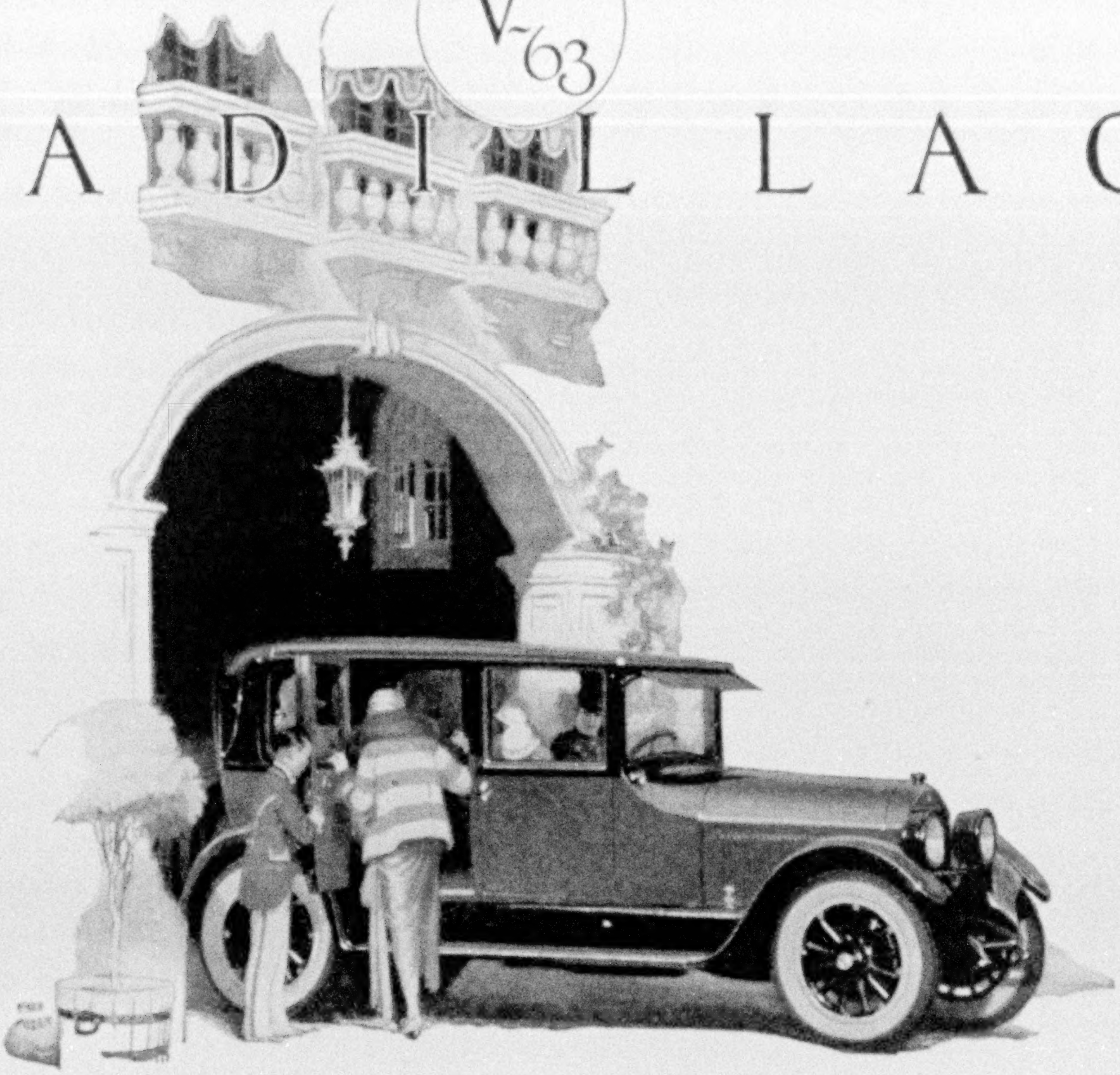
Street Address

City R.F.D.

State

V-63

CADILLAC



The owner of the V-63 Five Passenger Sedan travels in an atmosphere of richness and refinement.

Its beautiful Cadillac-Fisher Body, appointed with the care used in decorating an exquisite drawing room, affords every facility for the convenience and comfort of its passengers.

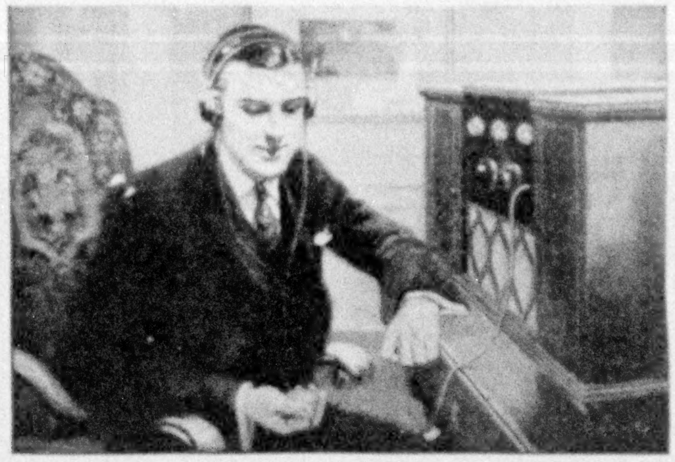
But the dominant appeal of the Sedan, as of all V-63 models, is its extraordinary performance.

Its harmonized V-Type eight cylinder engine—Cadillac's greatest contribution to automotive progress in recent years—functions with a smoothness and quietness new to motoring.

To the speed and power of this engine is added the safety of Cadillac Four Wheel Brakes.

Cadillac invites you to approach the V-63 Sedan with great expectations, and is confident that a single ride will convince you of its surpassing quality.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICH.
Division of General Motors Corporation



To the Million or More Members of the Radio Broadcasting Public, Elgin Makes This Announcement—

THROUGH the cooperation of the Chicago Board of Trade and the Elgin Time Observatory, a new time-broadcasting service has been put into effect.

Three times daily the precise time supplied over direct wire from our Observatory is broadcast through Station WDAP (360 meters, 833 kilocycles), at 3:12, 5:57 and 10:57 p.m.—extending over three minutes each period—the final signal is given at 3:15, 6:00 and 11:00 p.m. precisely.

Starting at 3:12 p.m., a dot is heard each second for 29 seconds. The 30th second is silent. Then again a dot each second for 25 seconds. Then 5 seconds of silence. This completes one minute of broadcasting.

The second minute duplicates the first. The third minute also—29 dots, 1 second silence; 25 dots, 5 seconds silence.

Then a long dash is heard at exactly 3:15 p.m.

This is Central Standard Time.

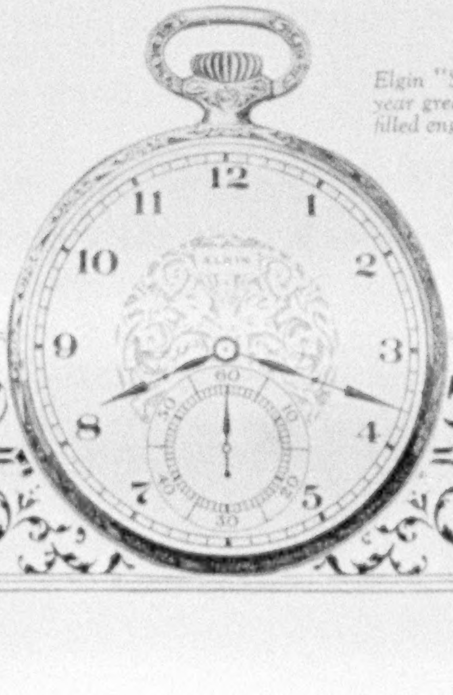
Now, with this time-broadcasting service, the Elgin Time Observatory assumes a new and broader significance than ever before.

It will bring home to every listener-in the professional timekeeping standards embodied in the Elgin Watch.

ELGIN

The Professional Timekeeper

ELGIN NATIONAL WATCH COMPANY
ELGIN, U. S. A.



Elgin "Streamline" in 25-year green or white Gold-filled engraved case, $40.

L.FELLOWS.23

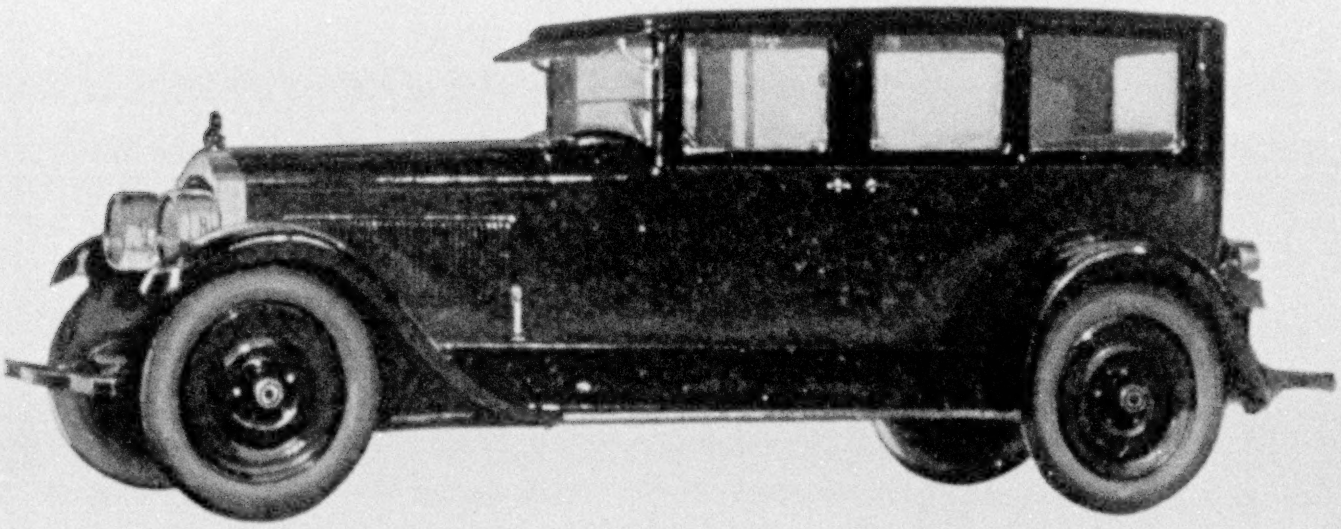
"Don't expect any sympathy from me, Edward; you know I begged you to stick to Kellys"

THE freedom from tire trouble, the long wear and the safety from skidding which Kelly-Springfield tires assure make them an invaluable asset on any car, new or old—a fact which many leading car manufacturers are recognizing by sending out their new models with Kellys as original equipment.

It costs no more to buy a Kelly

1899 – 1924

Only Packard can build a Packard

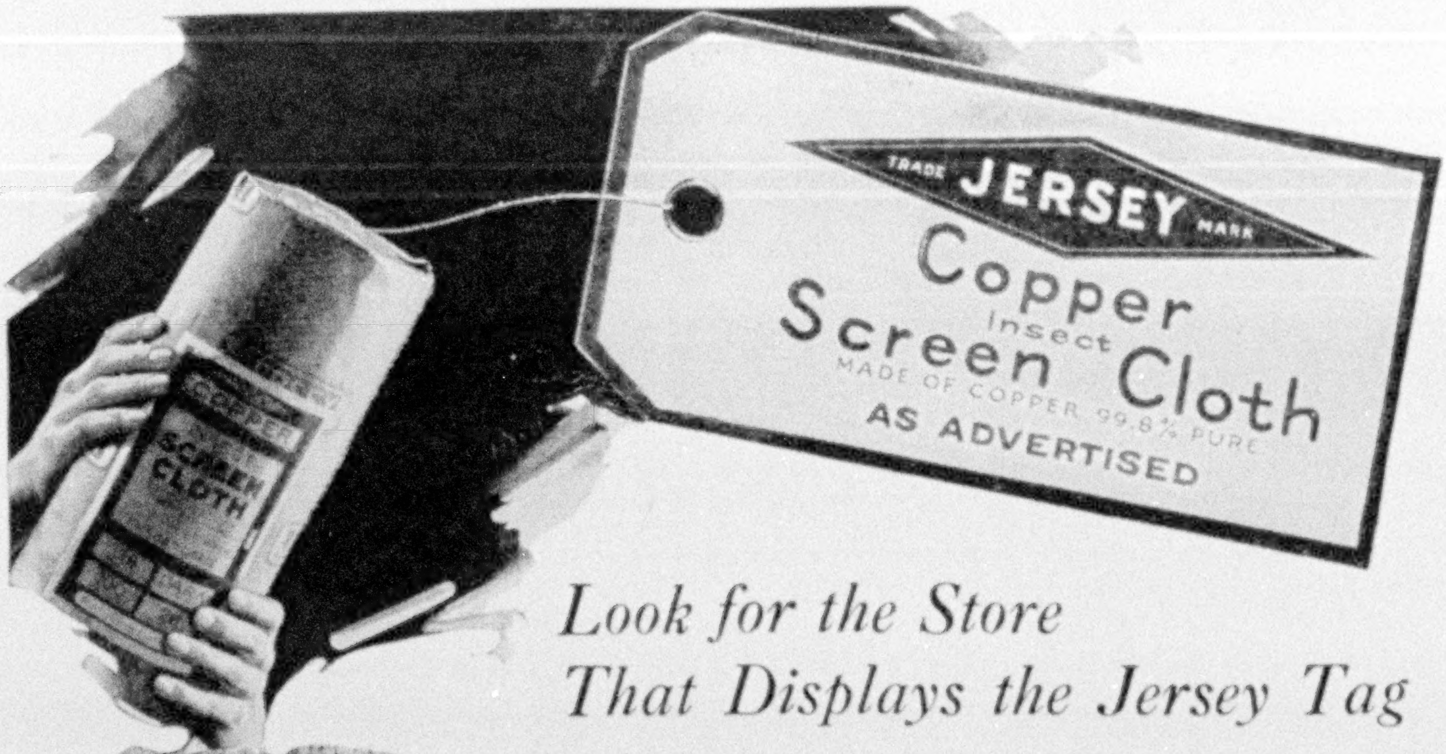


- Brilliant Beauty
- Distinctive Smartness
- Extraordinary Performance
- Economy of Operation
- Luxurious Comfort
- Low Upkeep Cost
- Years and Years of Service
- Pride of Ownership
- Sound Investment
- Standardized Nation-Wide Service
- High Resale Value

Four-wheel service brakes; 2 additional rear wheel brakes—a total of 6—on all Packard cars

ASK THE MAN WHO OWNS ONE

XUM

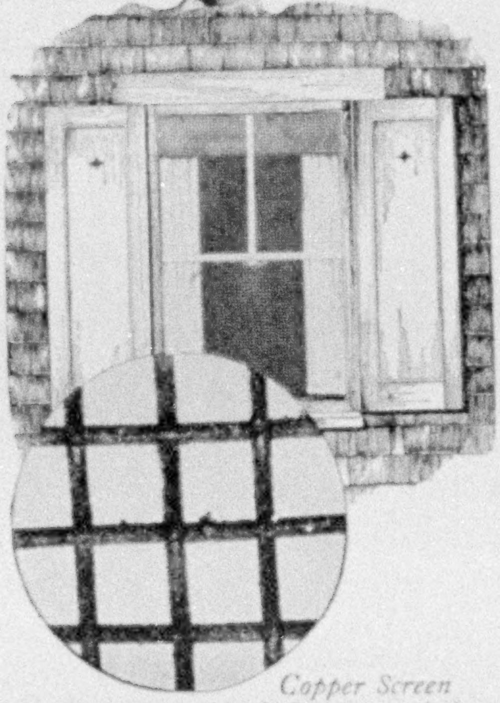


Look for the Store That Displays the Jersey Tag

Don't wait until the last minute to buy your screen cloth. Flies and mosquitoes will enter your house uninvited unless you keep them out. *Now* is the time to look for the hardware store that displays the giant Jersey tag shown in the illustration above.

In this store you can buy genuine *Jersey*—the insect screen cloth made of unalloyed copper 99.8% pure—the most durable metal in common use. And due to a special Roebling process Jersey is stiff and strong—and can be drawn tight and will *stay* tight without stretching or bulging.

You can buy Jersey in many widths and meshes—but 16 mesh is recommended by the United States Public Health Service, as coarser will admit mosquitoes. It comes in either natural or dark finish—the dark being practically invisible and always uniform in color.



Copper Screen Cloth (enlarged 4 diameters) made by The New Jersey Wire Cloth Company, which has been subjected to the action of salt air for more than twelve years.

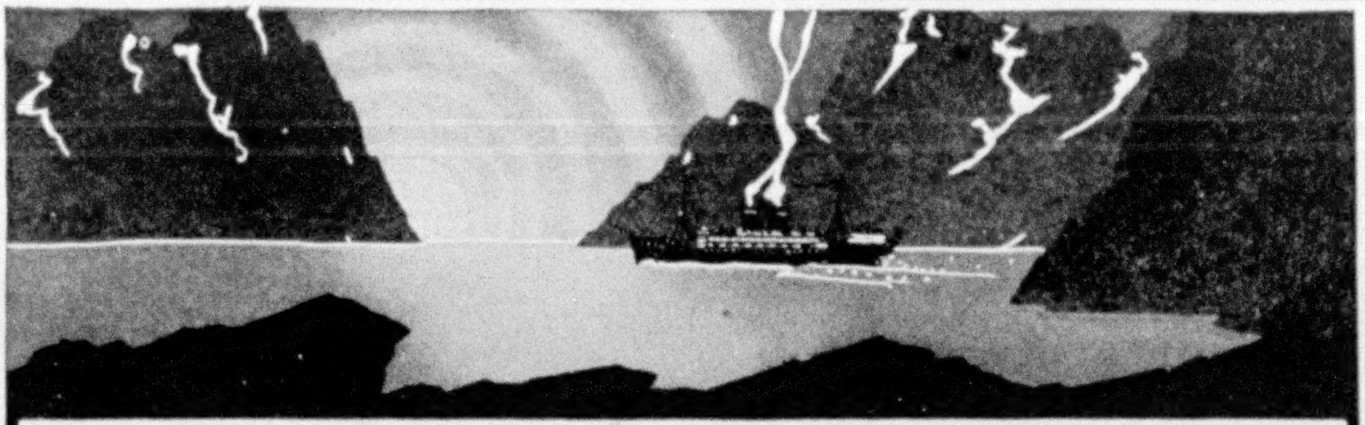
There is probably a merchant or custom-made screen maker in your locality who will give you samples of Jersey Copper Screen Cloth and quote prices. If you cannot obtain it write us and we will send you samples, an interesting booklet and tell you how it can be obtained. We will gladly assist you in every way possible to obtain the Jersey Copper Screen Cloth that you wish.

TRADE JERSEY MARK

THE NEW JERSEY WIRE CLOTH COMPANY
632 South Broad Street
Trenton New Jersey

Copper Screen Cloth

Made of Copper 99.8% Pure



RAYMOND-WHITCOMB CRUISE

Lands of the Midnight Sun

on the Cunard Liner S.S. "Franconia"

Iceland **Fjords of Norway** **North Cape**

Sailing from New York on June 26 the cruise is especially planned for either a complete five weeks vacation or to serve as the prelude to a summer Abroad.

The Cruise route has no equal in the world. To the *North Cape*, long one of the great goals of travelers it adds *Iceland,* that quaint Viking island where tourists are almost unknown, and a dozen of the famous *Norwegian Fjords* with sheer rock walls and unspoiled little villages that gleam on bits of beach.

The S.S. "Franconia" is the newest Cunard Liner and the largest and finest ship ever to sail to the North Cape. The Cruise is limited to 425 passengers.

Rates from New York to New York (with return on any Cunard sailing). $625 to $2100 without bath. $1325 to $3850 with bath.

Send for the Cruise booklet.

Tours to Europe

General Tours through all the countries of *Western Europe*, affording the maximum of comfort and pleasure. *Special Tours* to *Switzerland*, with motoring over the *Passes of the Alps*—to *Spain*—and a wonderful *Motor Tour of England and Scotland.* Using always the most luxurious liners, the smartest hotels, the best automobiles and in charge of experienced men, Raymond-Whitcomb Tours are "The Best in Travel." Send for our Europe Booklet.

Individual Travel Service

For those who prefer to travel without escort or on their own itinerary

Under this system ***you*** choose ***your own*** dates and routes—we make every reservation for you (hotels, railways, automobiles, guides, etc.) With such advance arrangements and the constant assistance of our chain of European offices your every need will be met and your trip will be a complete success from start to end.

Anywhere—*Europe, Holy Land, Egypt, North Africa*—on any standard of travel. Our new "Guide to European Travel" explains the system in detail. Send for a copy.

Raymond & Whitcomb Co.

New York
606 Fifth Ave
225 Fifth Ave.

Philadelphia
1338 Walnut St.

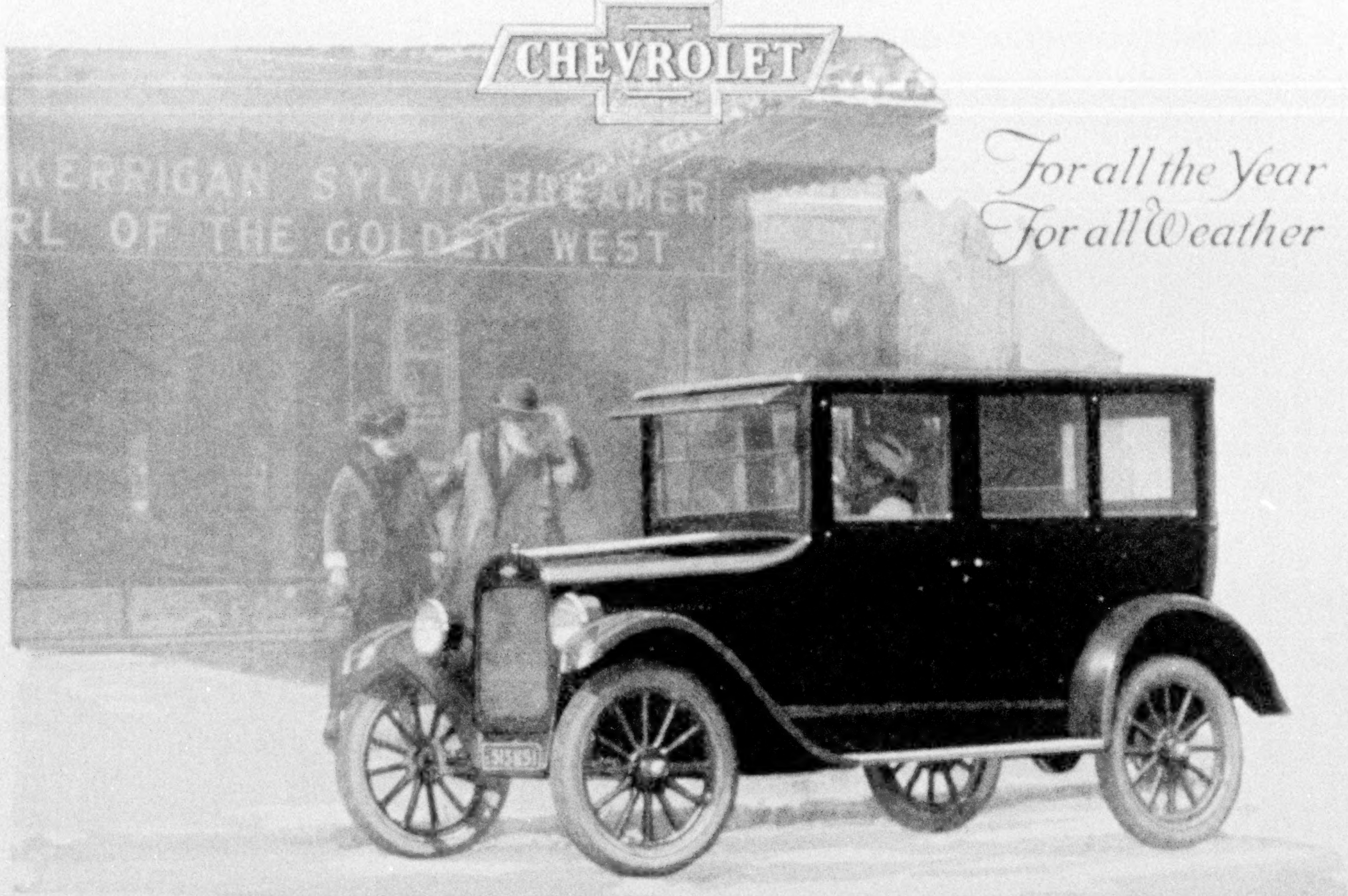
Chicago
112 So. Dearborn St.

San Francisco
657 Market St.

Los Angeles
458 So. Spring St.
Room 515

Executive Offices, Beacon and Park Sts., Boston *for Economical Transportation*

CHEVROLET



Superior Sedan

$795

f. o. b. Flint, Mich.

Prices f. o. b. Flint, Mich.

Superior Roadster	$490
Superior Touring	495
Superior Utility Coupe	640
Superior 4-Passenger Coupe	725
Superior Sedan	795
Superior Commercial Chassis	395
Superior Light Delivery	495
Utility Express Truck Chassis	550

The Lowest Priced, High Grade All-Year Sedan

The Superior Chevrolet Sedan is distinctly high-grade in appearance and workmanship. It is so economical to operate and maintain that it is feasible for either one passenger's daily use, or for the evening and Sunday requirements of the average family of five.

Recent improvements have added further to its remarkable dollar value. Larger brakes give increased ease and safety of driving. The front axle has been straightened and raised 1½ inches to take care of deeply rutted or sandy roads. The improved springs are of chrome-vanadium steel, yielding increased riding comfort.

These and other less important changes have been made in line with our constant aim to maintain quality leadership in economical transportation.

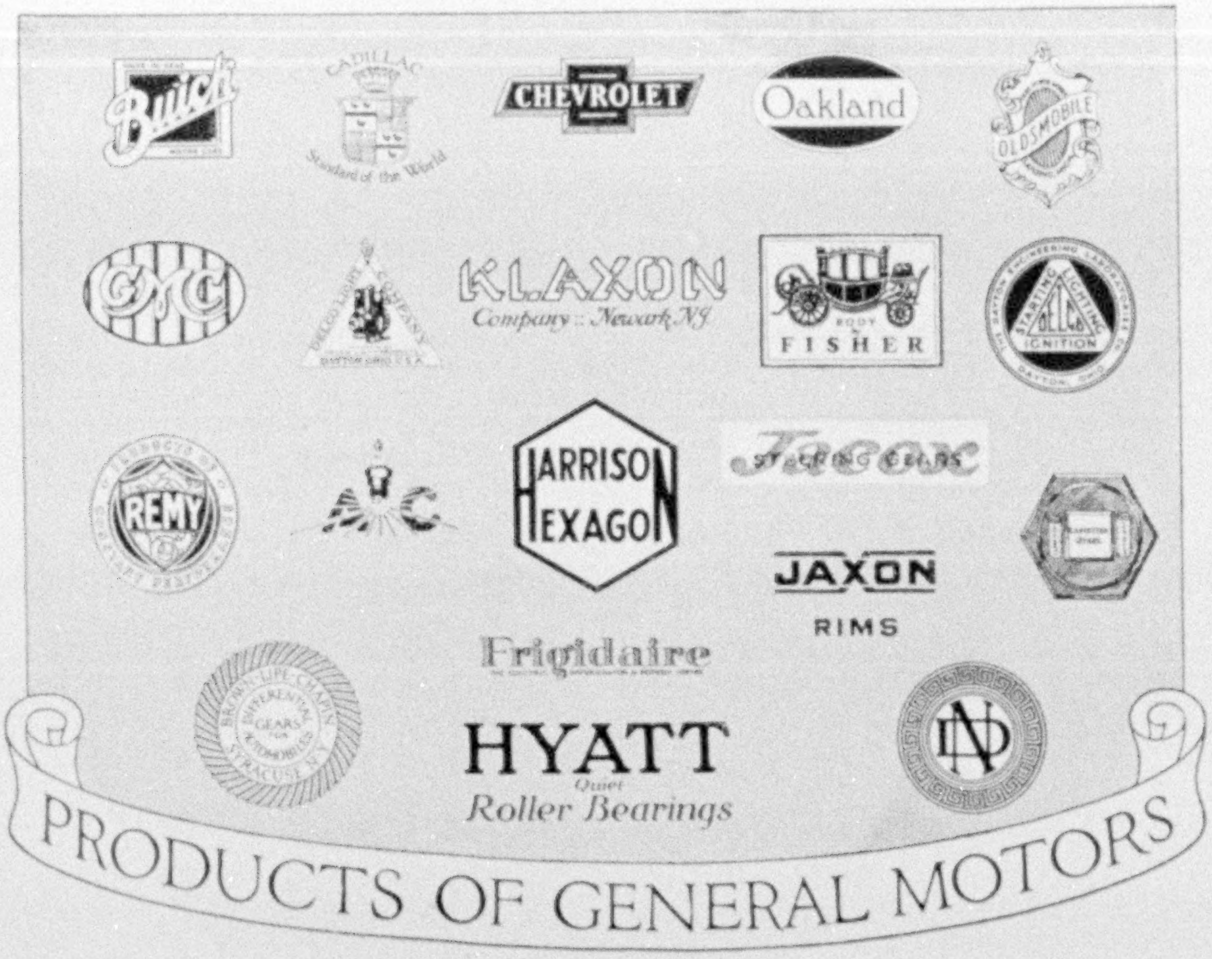
Chevrolet Motor Company, Detroit, Michigan

Division of General Motors Corporation

Five United States manufacturing plants, seven assembly plants and two Canadian plants give us the largest production capacity in the world for high-grade cars and make possible our low prices.

Chevrolet Dealers and Service Stations everywhere. Applications will be considered from high-grade dealers only, for territory not adequately covered.

FACTS ABOUT A FAMOUS FAMILY


Buick
CADILLAC
Standard of the World
CHEVROLET
Oakland
OLDSMOBILE
GMC
DELCO-LIGHT COMPANY
DAYTON OHIO U.S.A.
KLAXON
Company :: Newark N.J.
BODY BY FISHER
DAYTON ENGINEERING LABORATORIES CO.
STARTING LIGHTING IGNITION
DELCO
DAYTON, OHIO
REMY
AC
HARRISON HEXAGON
Jacox
STEERING GEARS
JAXON
RIMS
Frigidaire
BROWN-LIPE-CHAPIN
DIFFERENTIAL GEARS FOR AUTOMOBILES
SYRACUSE N.Y.
HYATT
Quiet
Roller Bearings
ND
PRODUCTS OF GENERAL MOTORS

The family's crests

You recognize these trademarks. They are the crests of manufacturing members of the General Motors family—symbols made immensely valuable by years of public confidence.

"Product of General Motors" is your assurance that back of each company are the resources and strength of the whole big family of which it is a part.

GENERAL MOTORS

Buick · Cadillac · Chevrolet · Oldsmobile
Oakland · GMC Trucks

2
3
Q
W
SHIFT LOCK
A
S
SHIFT KEY
Z
BACK SPACE
SHIFT KEY

The complete keyboard makes writing easier

The Remington is *that* portable with the four-row keyboard (42 keys)—just like the big machines. No shifting for figures. Everything arranged according to the business standard. Simplest to learn and easiest to operate.

It is compact, light, and easily carried in a handy case. Then there is the baseboard already attached—that makes writing convenient in any place or position.

To countless people who write—much or little—the Remington Portable lends an indispensable aid.

Examine the Remington Portable. Sold by all Remington branches and over 3,000 dealers. A demonstration will prove to you its adaptability for all personal writing.

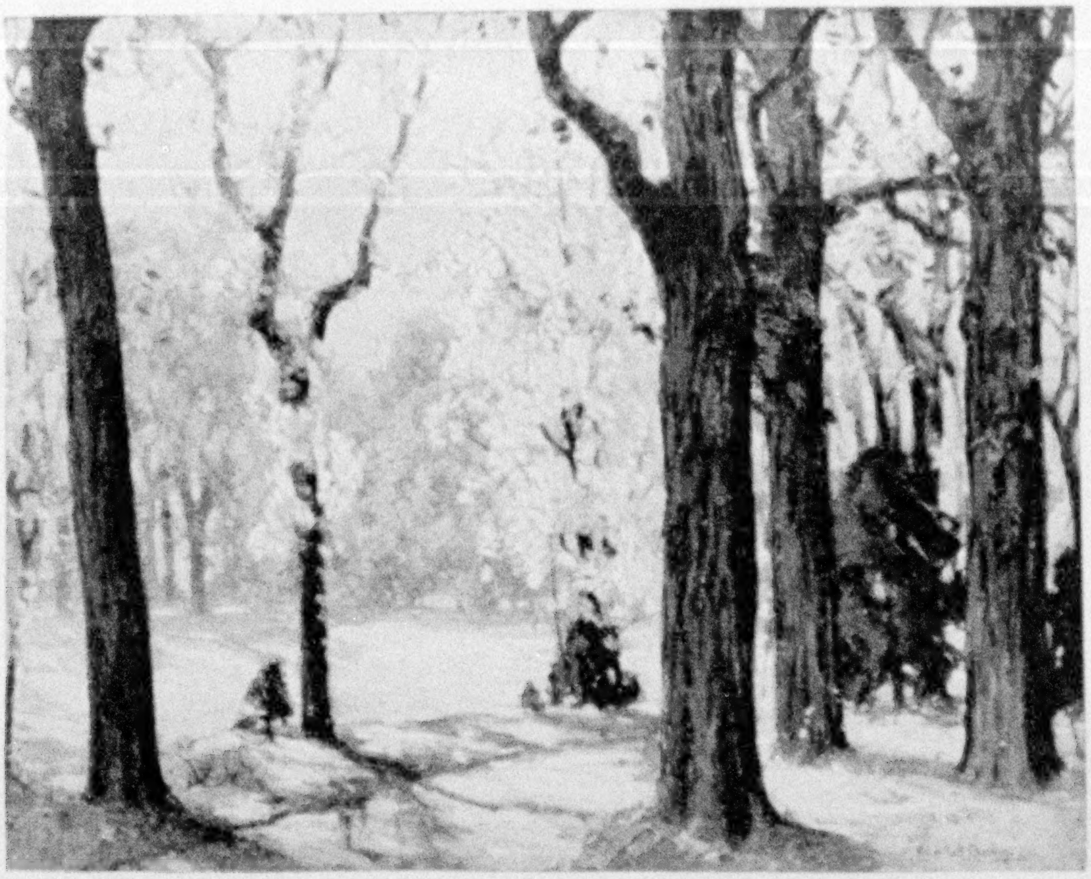
Convenient time payments, if desired. Let us send you "For You—For Everybody". Address Department 65.

We believe we make the best typewriter ribbon in the world, and its name is PARAGON

REMINGTON TYPEWRITER COMPANY
374 Broadway, New York

REMINGTON PORTABLE

THE RECOGNIZED LEADER—IN SALES AND POPULARITY



Reproduction from a painting in oil of Notre Dame of Maryland, by Frank Swift Chase

© The D.T.E.Co.,Inc.,1924

Davey Tree Surgeons are local to you!

IF YOU live between Boston and Kansas City or in California, Davey Tree Surgeons are near you. While the Davey Company has all the advantage of a large national business, and its experts are always subject to strict organization discipline, yet they actually operate in a local sense. Several squads of these experts live within a short distance of you and serve Davey clients there regularly. They do not come to you from some far off place.

The Davey Company has a permanent representative who lives within easy reach of you, and who is available on short notice. He would like the privilege of examining your trees periodically—without cost to you or any obligation on your part.

Twenty-two thousand people have been served by Davey Tree Surgeons—nearly four thousand of them in 1923. The business of the Davey Company amounted to nearly one million dollars last year. Seventy-five per cent of these clients paid less than two hundred dollars each. Whether you have one tree or a thousand trees needing attention, this reliable, expert service is available to you at a standard, reasonable charge.

Davey Tree Surgeons will give you more service per dollar than you can buy from any unskilled or half-trained men—and their work is done right. They are diligent workers—all carefully selected, thoroughly trained, and properly disciplined. You run no risk and take no chance when you engage them—but be sure you get real Davey men.

Do not assume that your trees are all right; Davey Tree Surgeons cannot help you when it is too late. Wire or write nearest office for expert examination.

THE DAVEY TREE EXPERT CO., Inc., 66 City Bank Building, Kent, Ohio

Branch offices with telephone connections: New York, Astor Trust Bldg., Fifth Ave. and 42nd St.; Boston, Massachusetts Trust Bldg.; Philadelphia, Land Title Bldg.; Baltimore, American Bldg.; Pittsburgh, 331 Fourth Ave.; Buffalo, 110 Franklin St.; Cleveland, Hippodrome Bldg.; Detroit, General Motors Bldg.; Cincinnati, Mercantile Library Bldg.; Chicago, Westminster Bldg.; St. Louis, Arcade Bldg.; Kansas City, Scarritt Bldg.; San Francisco, Hobart Bldg.; Montreal, 252 Laugauchitere, West.

Among prominent persons and institutions served by Davey Tree Surgeons are the following:

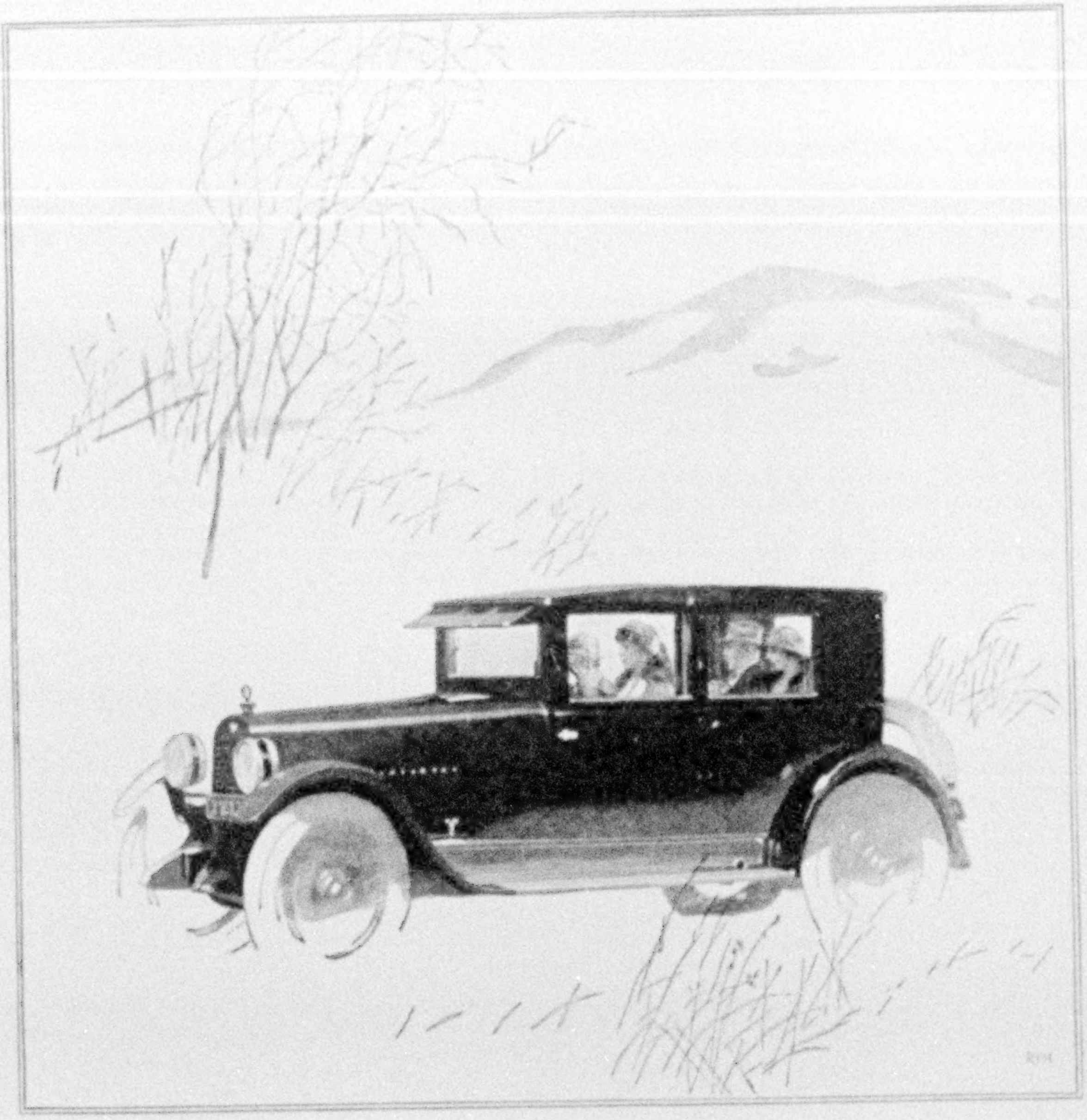
GEORGE ADE
W. C. TEAGLE
W. H. VANDERBILT
MRS. A. T. HERT
MRS. HENRY P. DAVISON
MICHIGAN STATE CAPITOL
HOLDERNESS SCHOOL FOR BOYS
DENNISON MANUFACTURING CO.
WHITE MOTOR CO.
CITY OF PLAINFIELD, N. J.

JOHN DAVEY
Father of Tree Surgery

Reg. U. S. Pat. Off.

DAVEY TREE SURGEONS

Every real Davey Tree Surgeon is in the employ of The Davey Tree Expert Co., Inc., and the public is cautioned against those falsely representing themselves. An agreement made with the Davey Company and not with an individual is certain evidence of genuineness. Protect yourself from impostors. If anyone solicits the care of your trees who is not directly in our employ, and claims to be a Davey man, write headquarters for his record. Save yourself from loss and your trees from harm



Closed-car comforts at open-car cost mean greater value than ever in the New Hudson Coach.

It has won instantaneous admiration everywhere. Not only is it one of the most beautiful cars ever created by Hudson, but roomier seating, wider doors and longer body give marked increase in passenger comfort.

To its more attractive body the Coach also adds a new and finer Super-Six chassis. It is the top step in eight years' development of exclusive Super-Six advantages. Everyone knows what they mean. They give Hudson a place of its own whenever performance, reliability and economy of operation and maintenance are considered. Now are added an extra ease of driving operation and smoothness of performance that only a ride can tell.

The Coach
$1475

New Models

Speedster - - - -	$1350
7-Pass. Phaeton - -	1425
Coach - - - - -	1475
Sedan - - - - -	1895

Freight and Tax Extra

HUDSON MOTOR CAR COMPANY
DETROIT, MICHIGAN

HUDSON

The Miracles of Nature

Revealed in Print and Picture

Come through the magic portals with us, into the wonderlands of nature! Meet the night-moth, the granny-cat, and the bird that wears a moustache. Here are tales stranger than fiction, more fascinating than any concerning human beings!

Have you read the marvelous secret that lives in the heart of a rose? Have you met the asp that murdered Cleopatra? Have you visited the land where oysters grow on trees?

The whole world of nature stretches out its arms to you. Come see the fish that cannot be tempted by a hook, that has never been caught by man! Come see the black sheep of the vegetable kingdom, that sins as any human sins! Come wander a while in the jungle with creatures of fur and feather!

There is no study more fascinating, more pleasure-giving, than the *study of nature*. Every plant and tree and flower, every insect and every animal, becomes your friend. You hear the sparrow calling to its mate, when others hear but a chirping. You hear the oriole and the whip-poor-will, when others hear only . . . a bird. The whole world becomes more beautiful!

The New Nature Library which we offer you is unquestionably the finest and most authentic ever published. It is already on the honor shelf in more than a hundred thousand homes. It is for nature-lovers, of course—for the men and women who appreciate the miracles of nature and want to understand them better.

A Delightful Booklet—*FREE*

We will be glad to send you, without obligation of any kind, a lovely little booklet, illustrated, which tells you everything you want to know about The New Nature Library. May we send you your copy today? You will enjoy it. Just clip and mail the coupon and we will be pleased to send it to you with our compliments.

DOUBLEDAY, PAGE & CO. Dept. N-793
Garden City, N. Y.

Do You Know—

—what plant makes soup of its guests?

—why the night-moth lives in the lily?

—what fish is known as the yellow-cat?

—how to attract birds to your home?

—the only bird that does not care for its young?

—what animal feigns death when an enemy approaches?

—what animal stamps when it is angry, as humans do?

—the bird that pays with its life for its laziness?

—what animal carries its young in its pocket?

—why the toad is the gardeners' best friend?

—what bird walks on the water?

—what insects have ears in their elbows?

—how to distinguish between mushrooms and toadstools?

The New Nature Library will make you well-informed in all branches of nature study. The books are not technical, but are threaded with rare bits of humor and human interest. The volumes are beautifully written, exquisitely illustrated. May we send you the booklet that explains this New Nature Library in detail? It's *free*.

Doubleday, Page & Co. Dept. N-793
Garden City, N. Y.

I am interested in your New Nature Library. You may send me your little illustrated booklet which tells about this beautiful library, with the understanding that there is no obligation to me.

Name..............................

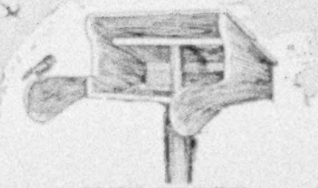
Address..............................

Mail Coupon
for
Illustrated
Free Booklet

XUM

SCIENTIFIC WREN HOUSE

It brings the wrens! 4-compartment house for succeeding broods. Beautiful to hang. Green. Oak with cypress shingles. 28" high, 18" dia.
$7.00



SHELTERED FEEDING STATION

Attracts early birds. Operates like a weather vane. Always dry. Green, of pine. With 8-foot pole, shelter 24x22x12 inches.
$8.50

FORTY YEARS LOVING STUDY OF THE BIRDS

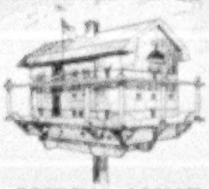
Dodson
Bird
Houses

DON'T MISS THE GREATEST DELIGHT OF THE SPRING!

Did you ever put up a Dodson bird house . . . 'tho chill winds still blew? And then, heigh-ho, some morning . . . the martins, the wrens, the other song birds arrive. Give them a perfect home! You watch them raise successive broods of songsters, destined to WORK merrily all summer ridding garden and trees of costly insect pests . . . They pay, these Dodson signs of hospitality! Send us your order from this page. Or write to Mr. Dodson

JOSEPH H. DODSON, Inc.
702 Harrison Avenue Kankakee, Illinois

Mr. Dodson is President of the American Audubon Association and Devoted Friend of the Song Birds



QUEEN ANNE MARTIN HOUSE

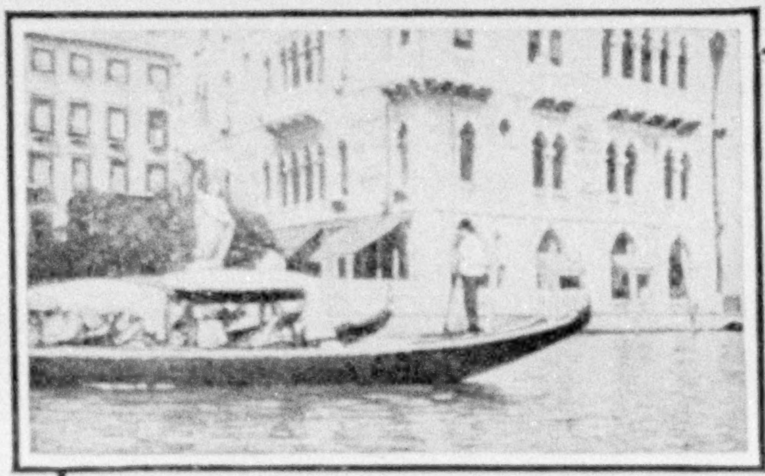
48 rooms for the beautiful martins who colonize. Scientific porch. White, green trims. Of pine, copper roof. 22-foot pole, 36x26x37 inches.
$60.00

FREE

Send for Mr. Dodson's fascinating booklet: "Your Bird Friends and How to Win Them." Things you should know about the work of the song birds!

Ask about Dodson's Famous Sparrow Trap, $8.00

REAL DODSON BIRD HOUSES SOLD ONLY FROM KANKAKEE



A Temple Tour Group on the Grand Canal, Venice

"As soon as we mentioned the name 'Temple Tours,' officials on boats, trains, etc., began to show us unusual courtesies—"
A 1923 Patron

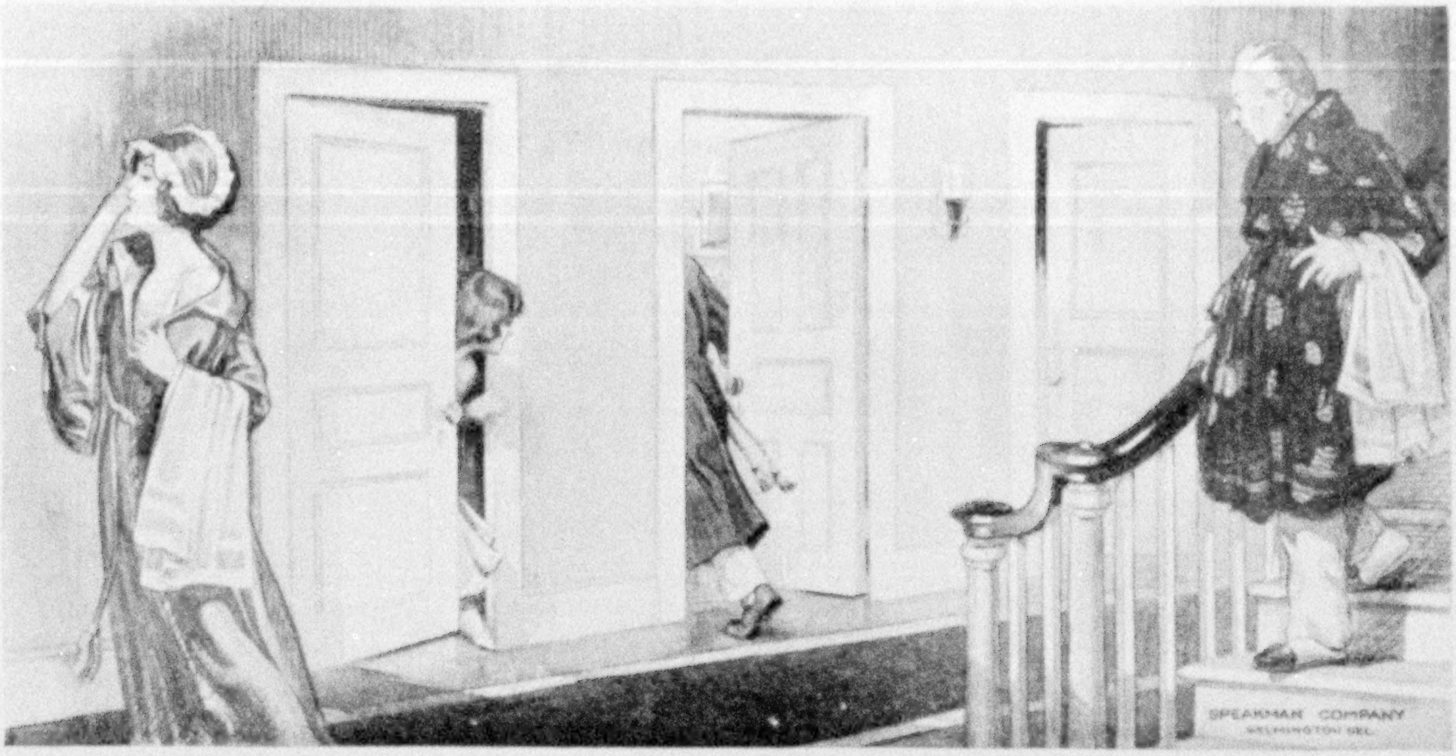
WHY? Because the large volume of our business, the kind of people who travel with us, and the generous treatment every member of our staff extends to those whose help counts, *command respect.* It all comes back to *you.*

Send for Illustrated Booklets: No. 8—European Tours for 1924
No. 7—Tours to Egypt and Palestine (Sail March)

Boston, Mass.
65 Franklin Street
New York
350 Madison Ave.
London
17 Shaftesbury Ave.
W. I.

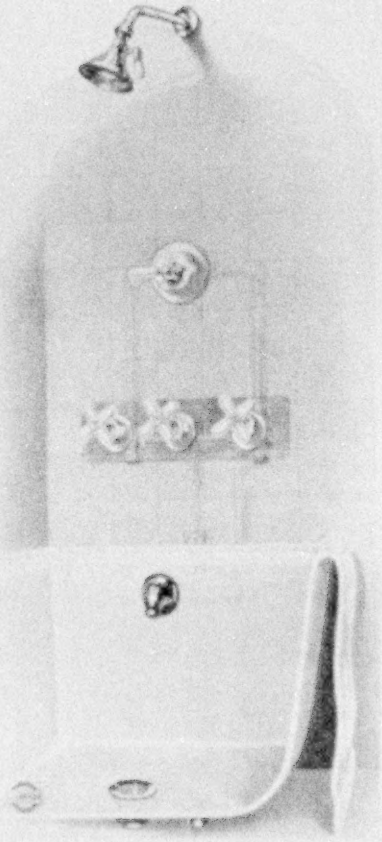
TEMPLE TOURS
Make Travel Mean More

Chicago
Chicago Temple
San Francisco
563-39th Avenue
Paris
9 Place de la
Madeleine



An Extra Bathroom

Will Stop the Annoyance and Embarrassment of the Morning Scramble



The ideal installation of shower over the tub – H-952½ Mixometer shower and Deshler Bath Fixture.

EVERYONE knows from experience the story that this picture tells—and it is all so unnecessary, for there are places in every home where an extra bathroom can be installed without you ever missing the space.

Considered in the light of added convenience the fitting up of this extra bathroom is really inexpensive. Your plumber, of course, will gladly tell you just how much it will cost. And while you are talking with him about the extra bathroom, don't forget to mention showers.

You can readily see how the shower enables still more persons to use the bathroom—you can take a shower in a couple of minutes. This is especially appreciated during the morning "rush hour." Besides, the shower is the clean way of bathing.

There are many types of showers. Some fit over tubs and others in stalls.

Your plumber knows all of these types. He has a Speakman Shower catalog, and other literature-folders and the like, showing features of Speakman Showers. Also we will be glad to send our shower booklet "Once-Used Water." In writing, we would appreciate having your plumber's name.

SPEAKMAN COMPANY, WILMINGTON, DELAWARE

SPEAKMAN SHOWERS

THE MODERN BATHROOM HAS A SHOWER

Do You Make these Mistakes in ENGLISH?

Does your English reveal your lack of education or does it prove that you are a person of culture and refinement? English is the one weapon you must use every day. This tells how you can improve it almost at once.

SHERWIN CODY

MANY persons say, "Did you hear from him today." They should say, "Have you heard from him today?" Some persons spell calendar "calender" or "calander." Still others say, "between you and I" instead of "between you and me." It is astonishing how many persons use "who" for "whom" and mispronounce the simplest words. Few persons know whether to spell certain words with one or two "c's" or "m's" or "r's," or with "ie" or "ei," and when to use commas in order to make their meaning absolutely clear. And most persons use only common words—colorless, flat, ordinary. Their speech and their letters are lifeless, monotonous, humdrum. Every time they talk or write they show themselves lacking in the essential points of English.

WONDERFUL NEW INVENTION

For many years Mr. Cody studied the problem of creating instinctive habits of using good English. After countless experiments he finally invented a simple method by which you can acquire a better command of the English language in only 15 minutes a day. Now you can stop making the mistakes in English which have been hurting you. Mr. Cody's students have secured more improvement in five weeks than had previously been obtained by other pupils in two years!

LEARN BY HABIT—NOT BY RULES

Under old methods rules are memorized, but correct habits are not formed. Finally, the rules themselves are forgotten. The new Sherwin Cody method provides for the formation of correct habits by constantly calling attention only to the mistakes you make.

One of the wonderful things about Mr. Cody's course is the speed with which these habit-forming practice drills can be carried out. You can write the answers to fifty questions in 15 minutes and correct your work in five minutes more. The drudgery and work of copying have been ended by Mr. Cody. You concentrate always on your mistakes until it becomes "second nature" to speak and write correctly.

FREE BOOK ON ENGLISH AND 15-MINUTE TEST

A command of polished and effective English denotes education and culture. It wins friends and makes a favorable impression upon those with whom you come in contact. And now, in only 15 minutes a day—in your own home—you can actually check up and see yourself improve by using the 100% self-correcting method.

Mr. Cody has prepared a simple 15-minute test which you can take in your own home. The correct answers are given so you can tell at once just where you stand. If you are efficient in English it will give you greater confidence; if you are deficient you surely want to know it. Write to-day for this test—it is free. We will also gladly mail you our new free book, "How to Speak and Write Masterly English." Merely mail the coupon or a postal card.

SHERWIN CODY SCHOOL OF ENGLISH
383 Searle Building Rochester, New York

SHERWIN CODY SCHOOL OF ENGLISH
383 Searle Building, Rochester, N. Y.

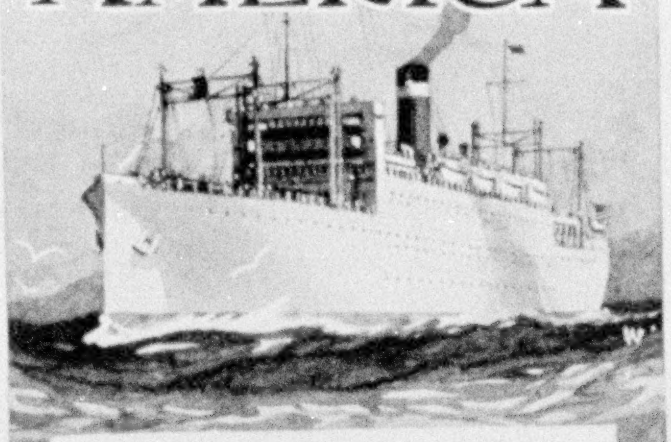
Please send me your Free Book, "How to Speak and Write Masterly English," and also the 15-minute test.

Name ....

Address ....

City .... State ....

Fastest Time to SOUTH AMERICA



THE magnificent U. S. Government ships to South America are breaking all records for popularity because they are outstandingly the finest and fastest ships sailing to the wonderland below the equator. Rio de Janeiro is now only 11 days away. Other ports of call: Montevideo and Buenos Aires.

Write for Free Booklets

Find out about the four white sister ships, the finest and fastest on the route. And they sail under the American flag! Find out about the pleasure and opportunities of South America. Send to-day for free illustrated booklets showing actual photographs of interiors of the ships and scenes in South America. Send in the information blank now. You cannot afford to miss this valuable information.

MUNSON STEAMSHIP LINE
67 Wall St. New York City
Local Agents in Larger Cities
Managing Operators for
U. S. SHIPPING BOARD

INFORMATION BLANK
To U. S. Shipping Board
Inform. Desk 1553 Washington, D.C.

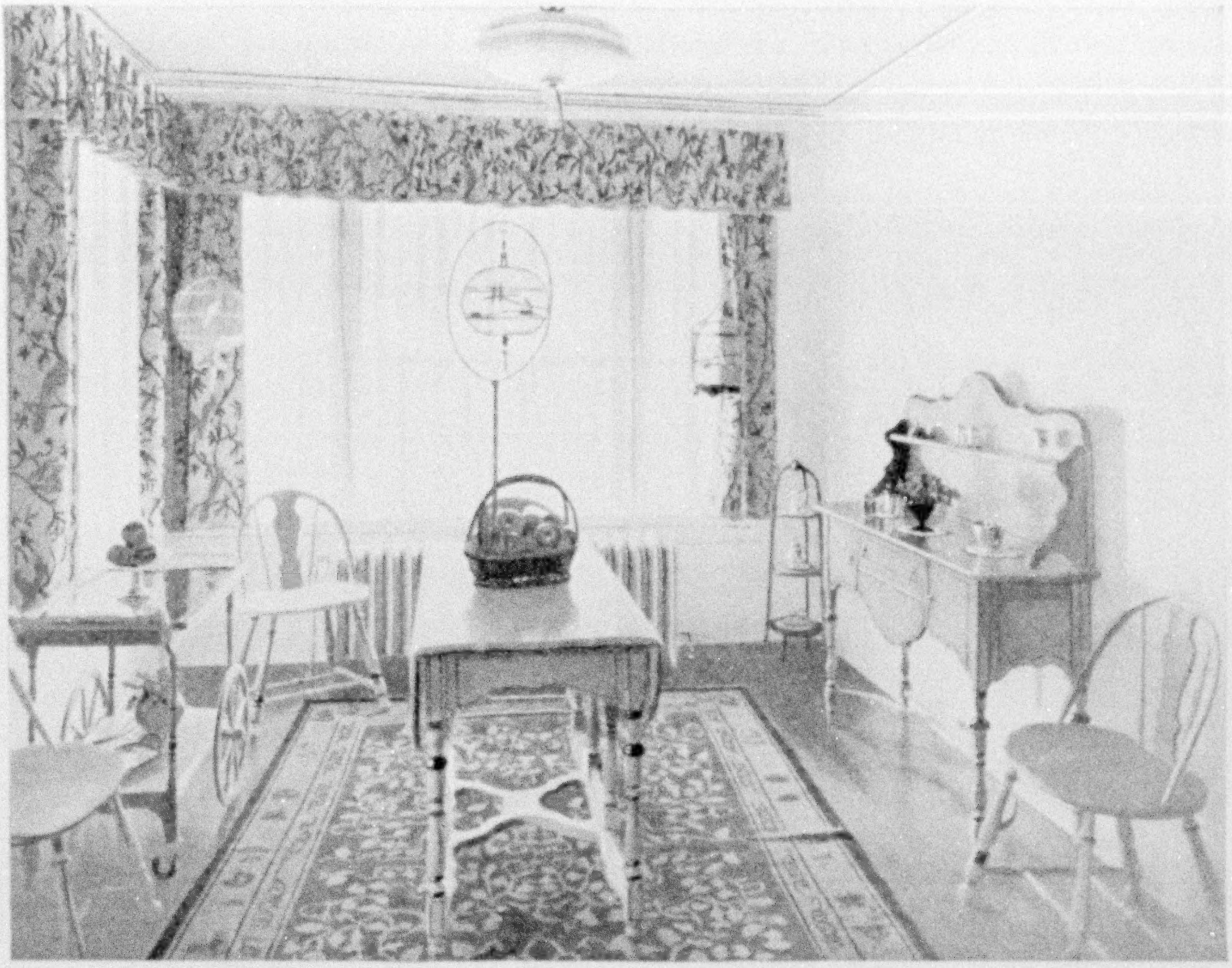
Please send without obligation the U. S. Government literature described above. I am considering a trip to South America ☐, to Europe ☐, to the Orient from San Francisco ☐, to the Orient from Seattle ☐.

If I go date will be about ______________________

My Name ______________________

Address ______________________

____



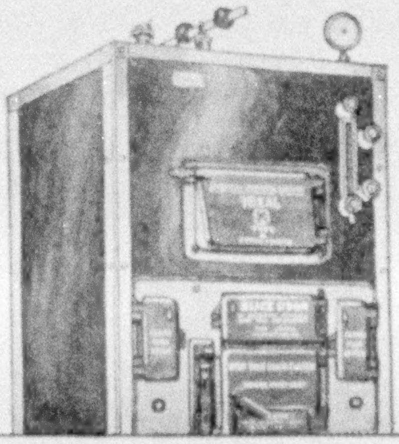
BREAKFAST—the zero hour

A VERY intelligent observer of modern life says that many domestic tragedies start at the breakfast table.

But people who are comfortable are courteous; they grow heated only when they are cold.

There will be no misunderstandings in this room. The American Radiator under the window is connected with a boiler in the cellar, whose name, like its service, is Ideal.

This is IDEAL TYPE A which you can put in place of your old-fashioned heater and pay for out of the savings in your fuel bills. Write to our nearest office for a beautifully illustrated book.



IDEAL BOILERS and AMERICAN RADIATORS save coal

Your Heating Contractor is our Distributor

AMERICAN RADIATOR COMPANY

104 West 42d Street
New York
Dept. 51
816 So. Michigan Ave.
Chicago

© ARCO, 1924

$300 and UP to the ORIENT

IF you are considering a trip to the Orient send the coupon below and learn how quickly and inexpensively you can go. Investigate today the luxurious "President" ships, the wonders of the Orient and cost of tours. The round trip can now be made in six weeks. Minimum fare $600.

Your dreams of the Orient can now come true. Send in the coupon now—today. Find out about these great U. S. Government ships, operated by the Admiral Oriental Line on the "Short Route" from Seattle and the Pacific Mail Steamship Company, over "Sunshine Belt" via Honolulu from San Francisco. Ports of call: Yokohama, Kobe, Shanghai, Hong Kong and Manila.

Admiral Oriental Line

L. C. Smith Bldg. . . . . . Seattle, Wash.
17 State Street . . . . . New York City
112 W. Adams St. . . . . Chicago

Pacific Mail S. S. Co.

508 California Street . San Francisco, Cal.
10 Hanover Square . . . . . New York City
503 South Spring Street . Los Angeles, Cal.

Managing Operators for

U. S. SHIPPING BOARD

FREE LITERATURE
Send this Coupon

INFORMATION BLANK
To U. S. Shipping Board
Info. Bureau 1553 Washington, D. C.

Please send without obligation the U. S. Government Booklet giving travel facts. I am considering a trip to the Orient

From Seattle ☐.
From San Francisco ☐.

Name ____________________

Address ____________________

5-Room Aladdin $548

We Pay the Freight

You can buy all the materials for a complete home direct from the manufacturer and save four profits on the lumber, millwork, hardware and labor.

6-Room Aladdin $695

Living room, dining room, 2 bedrooms, kitchen, bath. 4 other plans, some with pantries, dining alcoves, grade and inside cellar entrances. Get free Aladdin Catalog.

7-Room Aladdin $975

Aladdin catalog contains seven different plans of this house; some with inset porches, grade and inside cellar entrances, two and three bedrooms.

7-Room Aladdin $1,068

Large living room, dining room, kitchen, pantry, three bedrooms, clothes closets, bath. Semi-open staircase and rear porch. Four-bedroom plan with grade cellar entrance at same price

4-Room Aladdin $414

Here's your opportunity to avoid high apartment rentals. Build this home yourself. Two men can build it in a week Our instructions explain every step Five plans shown in Aladdin catalog

7-Room Aladdin $1,298

Dutch Colonial with full ceilings first and second floors. 14' x 22' living room, large dining room, kitchen, three bedrooms, bath, linen and clothes closets; grade cellar entrance.

12-Room Aladdin $1,932

Dutch Colonial for wide inside lots or narrow corner lots. Full ceiling heights entire second floor, sewing room, columned and inset front entrance. Get Money-Saving Aladdin catalog.

Price includes all lumber cut to fit; highest grade interior woodwork, siding, flooring, windows, doors, glass, paints, hardware, nails, lath, roofing, with complete instructions and drawings. Freight paid to your station. Permanent Homes—NOT PORTABLE. Many styles to choose from. Write nearest mill today for FREE Money-Saving Aladdin Catalog No. 357.

The ALADDIN Co., BAY CITY, MICHIGAN
Wilmington, North Carolina; Portland, Ore.; Toronto, Ont.

California

The GREATEST game in the world

GETTING the most out of life is the greatest game in the world.

In California it is played with a multitude of advantages you do not get elsewhere. You gain more for the same investment of effort or money; greater returns in business, in health, in recreation, in everything that makes up for you a new enjoyment of everyday life beyond anything you know.

More Money in the Bank

Financially Californians get more out of life than other people. They pay nearly double their per capita proportion of the national income tax. They own more than twice the average number of automobiles, traveling fourteen million miles a day along thousands of miles of magnificent highways. Three times the average number of homes have electric lights; every third farmhouse has a telephone; prosperity is everywhere.

Opportunity Everywhere

Life's wasted days do not exist in California. Twelve months in the year are marketing months from the millions of rich acres of the Great Valley, and the number of new farms coming into production is twenty times the national average. Twelve months in the year industry in the great San Francisco Bay manufacturing district, with plentiful water, cheap power and abundant raw materials, works at a high labor efficiency, unhampered by climatic extremes. Twelve months in the year people live joyfully out of doors and their children grow larger and stronger than the average elsewhere.

Low Excursion Fares

Come and discover California this year. Any railroad in America will sell you a low-cost, round-trip excursion ticket on or after May 15th, or give you a ten-day stopover in San Francisco at any time on a one-way ticket, and you can see for yourself what California offers.

Come to San Francisco

Come to San Francisco, America's coolest summer city, the headquarters of Californians Inc., a non-profit organization of citizens and institutions interested in the sound development of the state. Some of the most beautiful suburban districts in California adjoin this great port, the metropolis and trading center of the Great Valley and of the many garden valleys of the Coast Range.

Californians Inc. will give you every possible assistance when you arrive, and aid you in planning your trips or choosing your home. Write today for the illustrated, free booklet, "California, Where Life Is Better." It tells a story you should know, and every statement in it is authoritative. Fill in and mail the coupon and we will send it to you.

MAIL *this coupon for* **FREE BOOKLET** *about life in California*

San Francisco Bay
THE GREAT VALLEY
California
WHERE LIFE IS BETTER

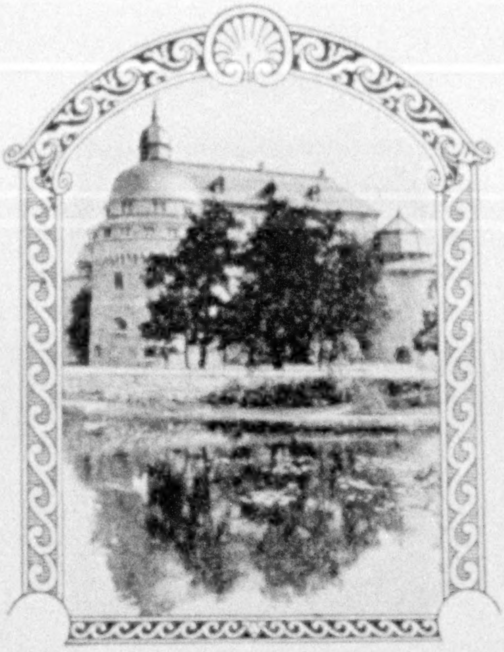
Californians Inc.

Headquarters
SAN FRANCISCO
140 MONTGOMERY STREET, ROOM 500

Please send me "California, Where Life is Better."

Name ____________________

Address ____________________



SWEDEN

Land of Today & Yesterday

SWEDEN and its friendly people smile their welcome to you—from the placid lakes and fertile valleys of the South to the snow-capped mountains and foaming waterfalls under the mystic midnight sun of the North.

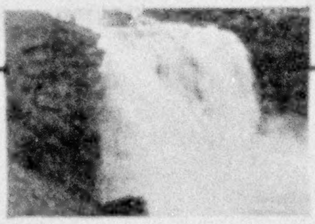
Quaintly contrasting with the beautiful, modern cities and great industrial plants are the majestic old castles and churches, ruins and runestones.

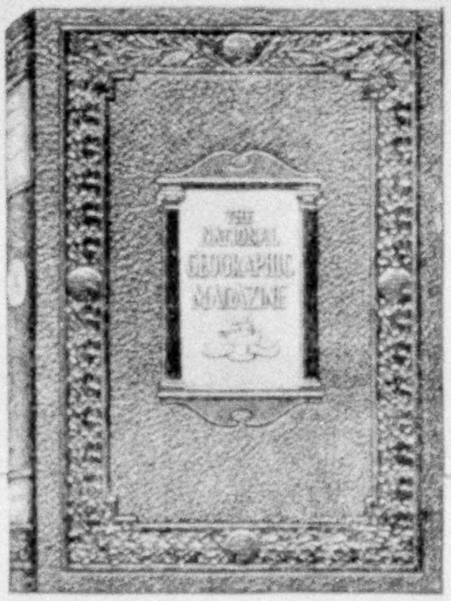
All this only nine days from New York direct or via England or the continent. Start your European trip with a new viewpoint—visit Sweden between May and September. English is spoken everywhere, and traveling facilities are excellent.

Consult any travel bureau—or call or write for book "Tours of Sweden 1924."

*Why Not Sweden
This Summer?*

SWEDISH STATE RAILWAYS
Travel Information Bureau
52 Vanderbilt Avenue, New York





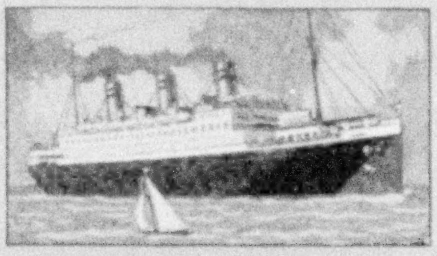
Covers
for
Geographic
Magazines
Now Ready

START binding your 1924 Geographics now in Molloy Made Binders, designed especially for this purpose. No need to wait until the year ends. These binders hold one to six copies and permit insertion of current issues as they arrive. You can bind magazines permanently without gluing or sewing. We furnish punch and complete instructions.

Molloy Made Binders, of hand-colored, embossed, two-tone leather cloth, are worthy of a place in the finest library. Price $2.00 each, or $3.65 a pair, postage included. Send your order and money to-day! We can furnish binders for issues ten years back. Specify years or volumes wanted.

THE DAVID J. MOLLOY COMPANY
2857 N. Western Avenue, Chicago, Ill.

FRANCE *via Cherbourg* · ENGLAND *via Southampton* · GERMANY *via Hamburg*



Those who have crossed more than once invariably choose their ship with care

STEAMERS DE LUXE	CABIN STEAMERS
RELIANCE	HANSA
RESOLUTE	CLEVELAND
ALBERT BALLIN	THURINGIA
DEUTSCHLAND	MOUNT CLAY

UNITED AMERICAN LINES
(HARRIMAN LINE)
joint service with
HAMBURG AMERICAN LINE

Write for descriptive booklet

39 BROADWAY, NEW YORK
171 W. RANDOLPH ST., CHICAGO
230 CALIFORNIA ST., SAN FRANCISCO

WASHINGTON

A city of wondrous beauty and fascination

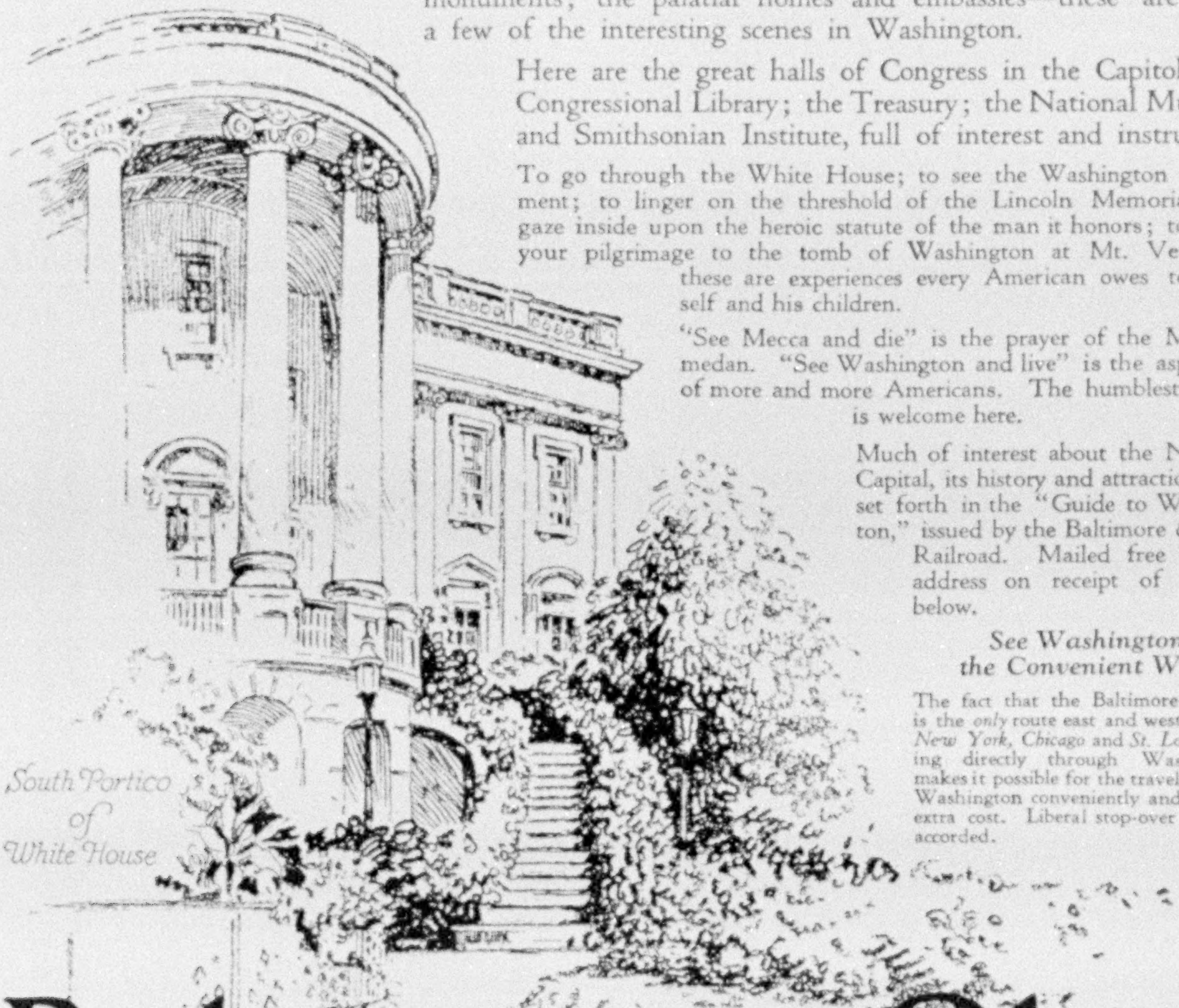
A NOBLE creation of the American Republic, no other city in the world surpasses Washington in grandeur and physical beauty. The wide, quiet, wooded avenues; the broad Potomac Mall; the charming circles and parks; the noble memorials and monuments; the palatial homes and embassies—these are only a few of the interesting scenes in Washington.

Here are the great halls of Congress in the Capitol; the Congressional Library; the Treasury; the National Museum and Smithsonian Institute, full of interest and instruction.

To go through the White House; to see the Washington Monument; to linger on the threshold of the Lincoln Memorial and gaze inside upon the heroic statute of the man it honors; to make your pilgrimage to the tomb of Washington at Mt. Vernon—these are experiences every American owes to himself and his children.

"See Mecca and die" is the prayer of the Mohammedan. "See Washington and live" is the aspiration of more and more Americans. The humblest citizen is welcome here.

Much of interest about the National Capital, its history and attractions, are set forth in the "Guide to Washington," issued by the Baltimore & Ohio Railroad. Mailed free to any address on receipt of coupon below.



South Portico of White House

See Washington the Convenient Way

The fact that the Baltimore & Ohio is the *only* route east and west between *New York, Chicago* and *St. Louis*, passing directly through Washington, makes it possible for the traveler to see Washington conveniently and without extra cost. Liberal stop-over privilege accorded.

Baltimore & Ohio

The Line of the Capitol Limited

W. B. CALLOWAY, Passenger Traffic Manager
The Baltimore & Ohio Railroad, Baltimore, Md.

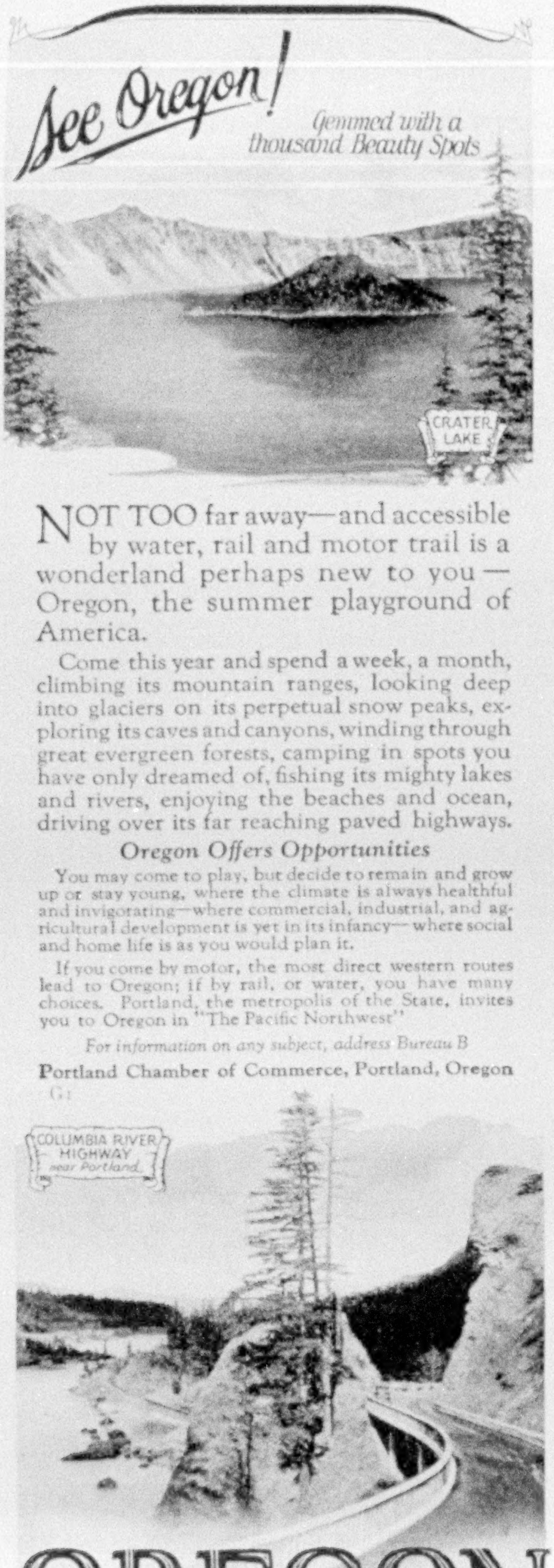
I shall appreciate your mailing me a copy of the 48-page "Guide to Washington" issued by your Company.

Name ____________________

Street or R. F. D. ____________________

City ____________________ *State* ____________________

N. 133


See Oregon!
Gemmed with a thousand Beauty Spots
CRATER LAKE
COLUMBIA RIVER HIGHWAY near Portland
OREGON
Invites You!
OREGON OFFERS OPPORTUNITY

NOT TOO far away—and accessible by water, rail and motor trail is a wonderland perhaps new to you—Oregon, the summer playground of America.

Come this year and spend a week, a month, climbing its mountain ranges, looking deep into glaciers on its perpetual snow peaks, exploring its caves and canyons, winding through great evergreen forests, camping in spots you have only dreamed of, fishing its mighty lakes and rivers, enjoying the beaches and ocean, driving over its far reaching paved highways.

Oregon Offers Opportunities

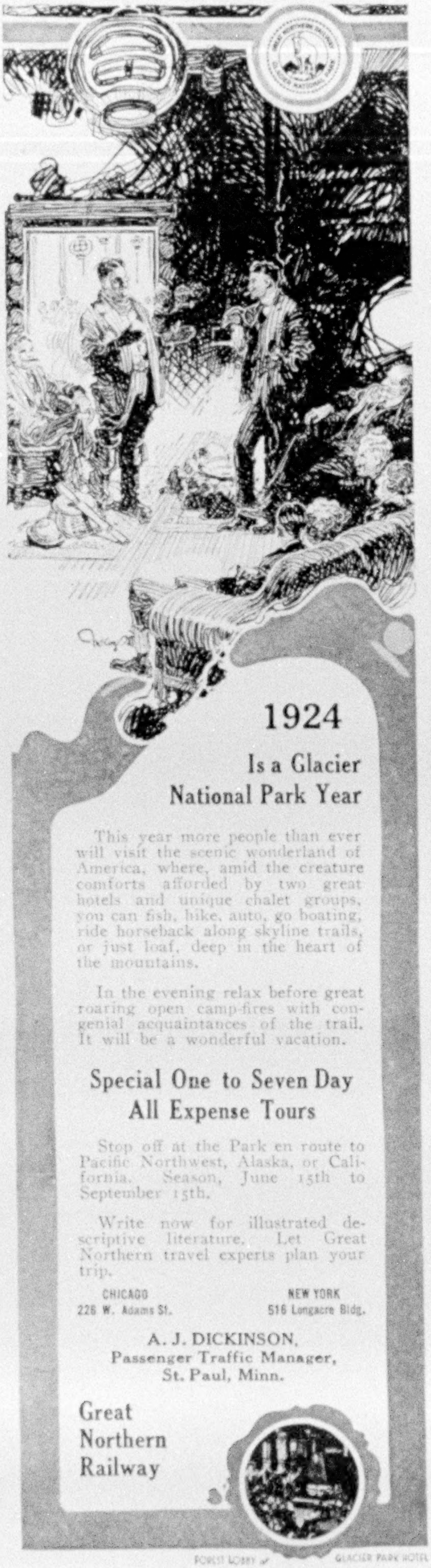
You may come to play, but decide to remain and grow up or stay young, where the climate is always healthful and invigorating—where commercial, industrial, and agricultural development is yet in its infancy—where social and home life is as you would plan it.

If you come by motor, the most direct western routes lead to Oregon; if by rail, or water, you have many choices. Portland, the metropolis of the State, invites you to Oregon in "The Pacific Northwest"

For information on any subject, address Bureau B

Portland Chamber of Commerce, Portland, Oregon

G1


FOREST LOBBY of GLACIER PARK HOTEL

1924

Is a Glacier National Park Year

This year more people than ever will visit the scenic wonderland of America, where, amid the creature comforts afforded by two great hotels and unique chalet groups, you can fish, hike, auto, go boating, ride horseback along skyline trails, or just loaf, deep in the heart of the mountains.

In the evening relax before great roaring open camp-fires with congenial acquaintances of the trail. It will be a wonderful vacation.

Special One to Seven Day All Expense Tours

Stop off at the Park en route to Pacific Northwest, Alaska, or California. Season, June 15th to September 15th.

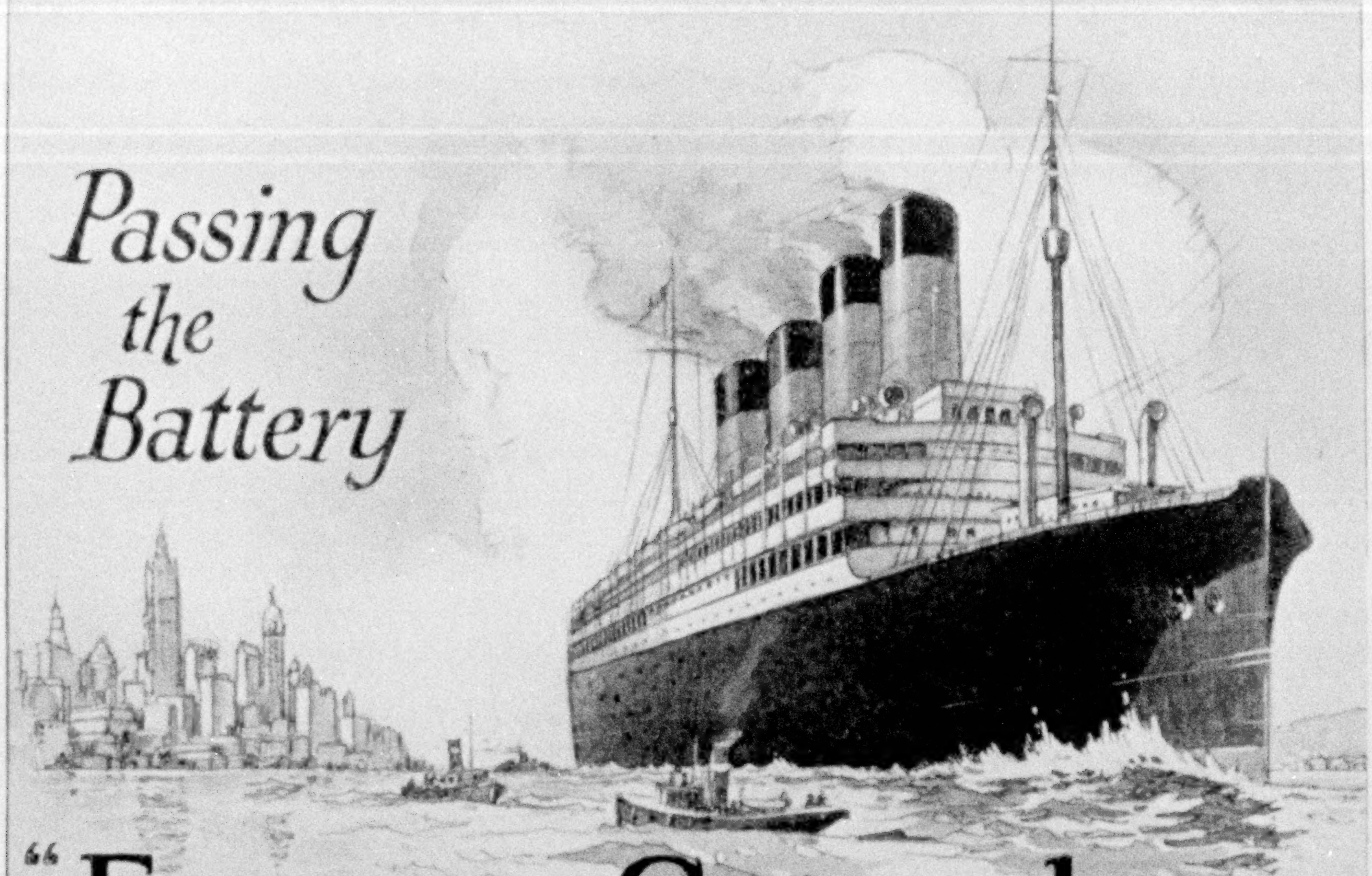
Write now for illustrated descriptive literature. Let Great Northern travel experts plan your trip.

CHICAGO
226 W. Adams St.

NEW YORK
516 Longacre Bldg.

A. J. DICKINSON,
Passenger Traffic Manager,
St. Paul, Minn.

Great
Northern
Railway



"Famous Cunarders"

When the first Cunarder, back in the early forties, paddle-wheeled her way into New York harbor, she was acclaimed *the* wonder of her time. Since that day, Cunard leadership has been demonstrated again and again. Today when one of the famous Cunarders passes the Battery, she represents but one unit of the Company's fleet, which remains unsurpassed in construction, magnificence of passenger accommodations, cuisine, service, and general management.

The Fastest Passenger Service in the World

AQUITANIA BERENGARIA MAURETANIA

Other services—a little less speedy but no less comfortable—by FRANCONIA, SAMARIA, LACONIA, SCYTHIA, CARONIA, CARMANIA, TYRRHENIA, CALIFORNIA, TUSCANIA, CAMERONIA, ANDANIA, ANTONIA, AUSONIA, etc.

Write for full information

CUNARD
and **ANCHOR**
STEAM SHIP LINES
Cunard Building, 25 Broadway, New York
or Branches and Agencies

COLUMBIA UNIVERSITY

Home Study Courses

A Step in the Right Direction

WHEN Columbia University established its Home Study Courses it took a step which many educators thought radical for an institution of its standing and traditions.

However, the step was one in the right direction. That the courses have met a long felt need and have greatly broadened the scope of Columbia's service is evidenced by the volume of responses to these announcements which have been received from all parts of the country. The mere statement of the fact that the educational facilities of Columbia could be taken advantage of by a student in Maine or California, in the Dakotas or Florida, proved to be a clarion call which evoked instant answer from men and women in greatly varied walks of life.

The Columbia Home Study Courses are prepared and conducted by members of the University teaching staff, with whom each student is in direct contact throughout the course. The Home Study Courses, however, have been organized differently from the resident college courses so that they may be conducted in writing and so that the instructor may supervise the work of each student and test it for thoroughness.

Many of these courses are specifically planned to increase the student's business efficiency, others are of the purely cultural type which broaden the mental horizon and bring into one's life the added interest which always accompanies greater knowledge.

Your personal inclination may lead you in one direction or in the other. In either event the Columbia Home Study Courses offer you opportunity to attain, without interference with your present duties or vocation and from a truly national university, most of the advantages which a resident course would give you. Although no point credits toward an academic degree are given for the work in the Home Study Department, the University's Certificate is issued upon the satisfactory completion of each course.

If you will write to the University you will receive all information regarding the Home Study Courses.

The following are a few of the many subjects covered by the Home Study Courses:

Short Story Writing
Psychology
English Composition
Mathematics
Economics
Accounting
English Literature
History
Philosophy
Business English
American Literature
Photoplay Composition
English
Secretarial Studies
Foreign Languages
Business Law
Modern Drama
Journalism
Spanish
Current Literature
French
Drafting
Business
Psychology of Advertising
and Selling
Sociology
Scouting
Foreign Exchange
Typography
High School Courses
Finance
Commerce
Girl Scouts
German
Composition of Lyric Poetry
Latin
Magazine Articles and
Newspaper Writing
Biblical Literature
Dramatic Composition
Public Speaking
Fire Insurance
American Government
Italian
Greek
Comparative Literature
Stenography
Speech Composition
Typewriting

Columbia University
in the City of New York

Home Study Department, Room D-13, Columbia University, New York City. Please send me the Bulletin of Columbia Home Study Courses. I am especially interested in the following:

....

Name .... Address ....

© N.Y. Edison Co
From Underwood

New York City is lighted by millions of MAZDA lamps, a brilliant example of the fact that out of every 100 people in the United States 37 live in electrically lighted homes.

The best lighted country

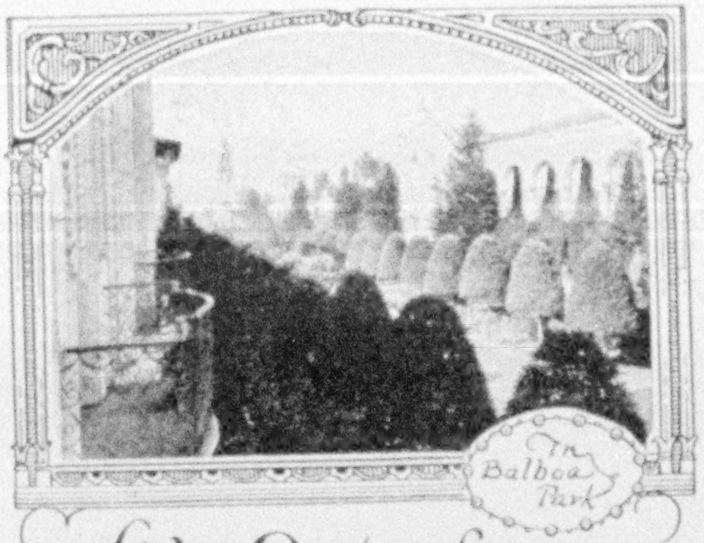
Ever since man discovered he could conquer darkness with artificial light, civilization has been marching on.

Our country leads the nations of the world in the proportion of people who live in electrically lighted homes and enjoy the advantages of electrically lighted streets.

Lighting the streets — and the highways too — carries electricity through town and country so that all may enjoy its benefits.

This is the mark of the General Electric Company, an organization of 100,000 men and women engaged in producing the tools by which electricity — man's great servant — is making the world a better place to live in.

GENERAL ELECTRIC



Live Out of Doors the Year 'round

IT'S an experience you'll never forget—your first winter in San Diego, California.

The day in your home town when it's zero or below, and the furnace works overtime, will be one of exhilaration and joyful anticipation in San Diego. Here the average midday temperature from December to March is 63 degrees.

Picture a great gathering for a community celebration at the magnificent open-air pipe organ pavilion in Balboa Park with its perpetual setting of greenest foliage and brightest flowers—a scene typical of everyday life in San Diego as thousands of others have found it, and as you will find it when you come.

Send the coupon today for the fascinating story of

San Diego
California

This booklet tells a wonderful story about San Diego, California. Sign the coupon and get it free by return mail.

San Diego California

Come Direct to San Diego over the new San Diego & Arizona Railway, operated in connection with the Southern Pacific, Rock Island and the E. P. & S. W. GOLDEN STATE ROUTE, or by way of the Southern Pacific SUNSET ROUTE, via New Orleans, in connection with the San Diego & Arizona Railway, and enjoy a daylight ride through magnificent Carriso Gorge and old Mexico.

SAN DIEGO-CALIFORNIA CLUB
524 Chamber of Commerce Building
San Diego, California

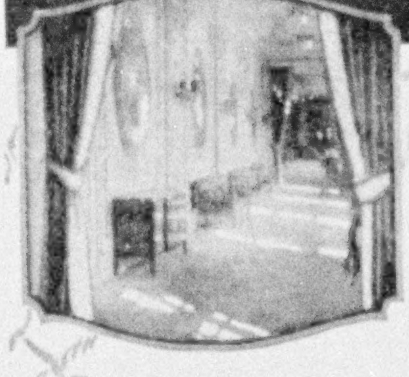
Gentlemen: Please send me, free, your fascinating story of San Diego, California.

NAME ______________________

STREET ______________________

CITY STATE

Your personal comfort —aboard ALL our ships



Corridor to Music Room—*Homeric*

YOUR cabin—the acme of comfort. Your food—temptingly prepared, skillfully served. Your hours of leisure—full of pleasant activity, of interest, of relaxation. Your trip—a joy throughout.

The Magnificent Trio:

The *Majestic*—largest ship in the world, holder of the speed record to Continental Europe; the *Homeric* and *Olympic*—these superb, monster ships maintain a weekly express service to Southampton and Cherbourg.

Cross for as little as $115:

Cross in comfort on our cabin ships. Even the minimum rate ($115 on some of them) gives you the best the ship affords.

Of Especial Interest:

The British Empire Exposition at Wembley Park from April to October, the famous races at Epsom, Ascot, Deauville, the Olympic games—these are just a few of the high lights of the coming season in Europe.

Sailings to 10 Ports:

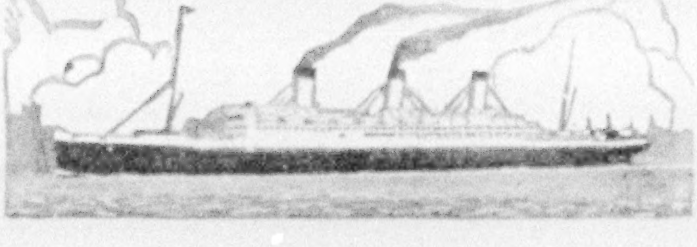
Queenstown (Cobh), Liverpool, Plymouth, Southampton, London, Cherbourg, Antwerp, Hamburg, Naples and Genoa.

Interesting booklets free on request.

WHITE STAR LINE
AMERICAN LINE **RED STAR LINE**
INTERNATIONAL MERCANTILE MARINE COMPANY

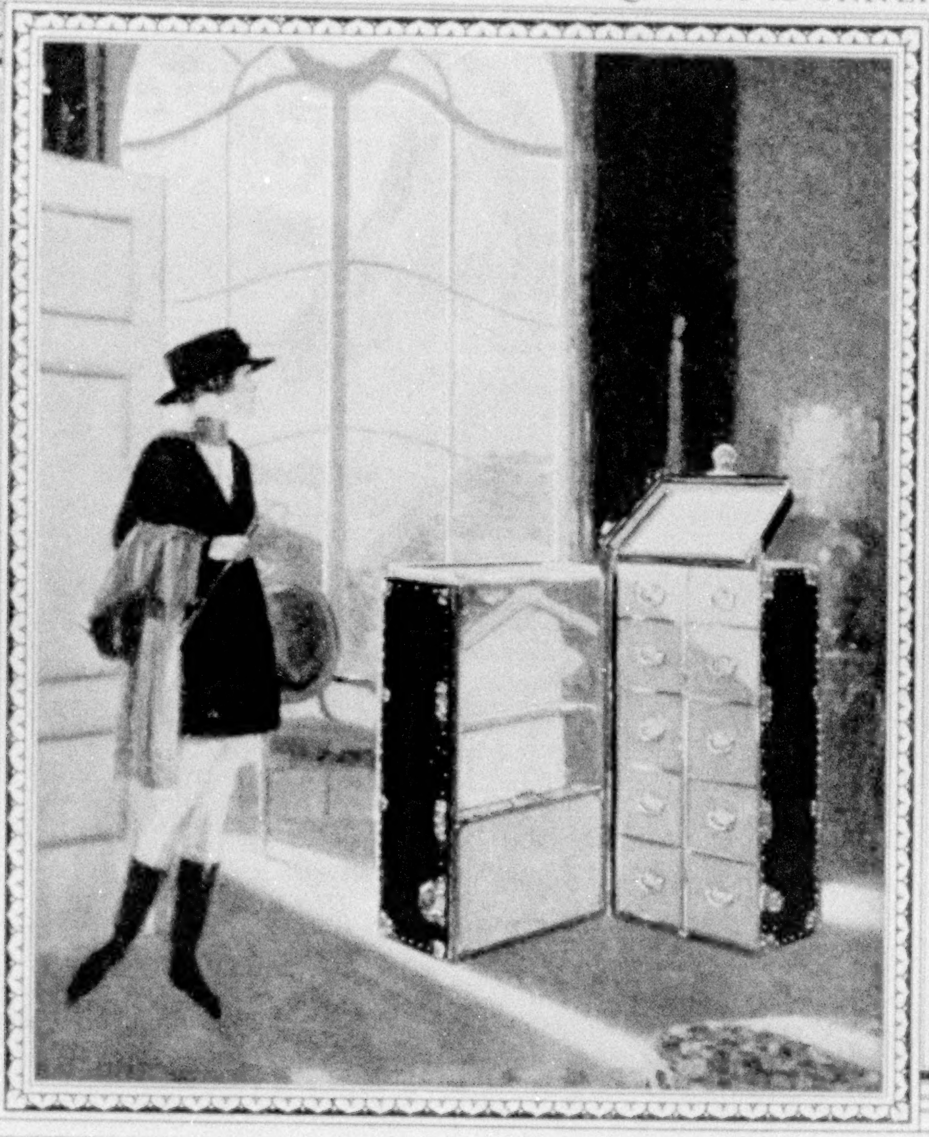
For intelligent assistance in planning your trip call at No. 1 Broadway, the company's offices elsewhere, or any authorized steamship agent.

Majestic, World's Largest Ship



HARTMANN
REG. U.S. PAT. OFF.
Cushion Top
WARDROBE
TRUNKS

THE WORLD-WIDE RECOGNITION OF THIS NAME AND THIS MARK PROVES THAT APPRECIATION OF QUALITY IS UNIVERSAL



"NOT A WRINKLE AT THE END OF THE TRIP"

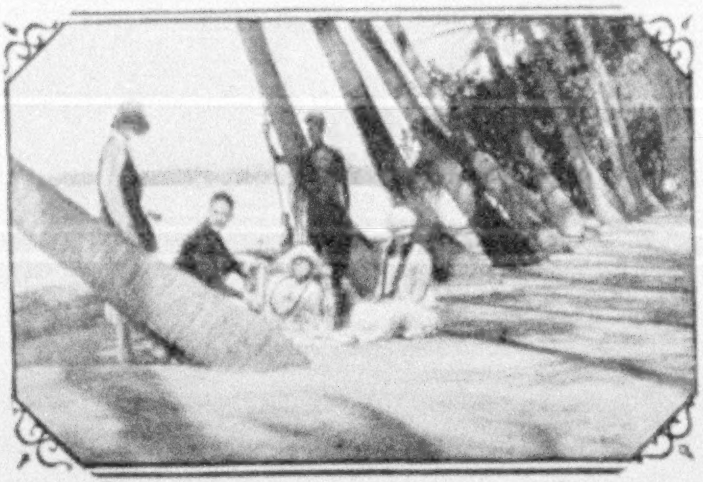
EVERY journey emphasizes the wisdom of your choice when you selected your Hartmann. There is a natural pride in possessing a wardrobe trunk of such distinction. Its quality commends it and its value is further realized in its steadfast, convenient travel service. Ask for the new Hartmann where better luggage is sold.

HARTMANN TRUNK COMPANY, *Racine, Wisconsin*
M. LANGMUIR MFG. CO., LTD., TORONTO, *Licensed Canadian Manufacturers*
J. B. BROOKS & CO., LTD., BIRMINGHAM, ENGLAND, *Distributors for Great Britain*

HARTMANN

BE SURE THE HARTMANN RED ✕ IS ON THE TRUNK YOU BUY

Copyright, 1924, by Hartmann Trunk Co.



Listen to the South Seas' Lure

HAWAII

Are you weary of icy blasts, snow and slush underfoot? Of the daily routine that absorbs your life? Do you long for change of scene and climate? Then listen to the lure of the South Seas and visit Hawaii.

Those islands of romance, melody, flowers, tropic fruits, flying fish, soft trade winds whispering through coco palms, are only 5 to 8 days off the Pacific Coast. A delightful voyage; dreamy days and exotic nights in a land you'll love; these may be yours for as little as $300 to $400 in money and three to four weeks in time.

The cost includes round-trip, first-class accommodations on a modern ocean liner from San Francisco, Los Angeles, Seattle or Vancouver, B. C., and all hotel and sightseeing expense. Good hotels and inter-island cruising facilities.

Surfing and moonlight swimming at Waikiki; golf on several good courses; tennis, motoring, mountain hiking, deep-sea fishing—all outdoor sports. Kilauea Volcano, spectacular live crater, absolutely safe and easily accessible, in Hawaii National Park. Rare coral-walled marine gardens where shoals of rainbow fish sail round in symphonies, madrigals and fantasies of color.

With all its South Sea fascination, Hawaii is a part of the United States, with the same laws, language, customs, conveniences. A beautiful land in which to own a home and live at least part of every year.

Go now to your nearest travel agency and arrange for the trip, or fill, clip and mail the coupon below.

HAWAII TOURIST BUREAU
594 Monadnock Building, San Francisco, or
874 Fort Street, Honolulu, Hawaii, U. S. A.

Send me your new free illustrated booklet on HAWAII; also latest issue of Tourfax, containing data on special trips, hotel rates, etc.

NAME________________

STREET________________

CITY________________ STATE________

The Certainty of Safety

THE record of this House, now 42 years without loss to any client, is the best assurance an investor can have of the certainty of prompt payment of Straus Bonds.

Write for the reasons for this record, and current offerings of sound bonds, yielding 6 and 6½%. Ask for BOOKLET C-1408

S.W. STRAUS & CO.
Established 1882 · Offices in more than Fifty Cities · Incorporated

STRAUS BUILDING
565 Fifth Avenue
at 46th St.
NEW YORK

STRAUS BUILDING
6 North Clark Street
at Madison St.
CHICAGO

79 Post Street, SAN FRANCISCO

42 Years Without Loss To Any Investor

© 1924—S. W. S. & Co., Inc.

Hawaii

DeLuxe TOUR $398

ECONOMY TOUR $280.

Both tours include 21 day round trip with all expenses paid, including side trips.

Sailings every Wednesday from San Francisco and every 35 days from Seattle.

Send coupon for booklet and folder.

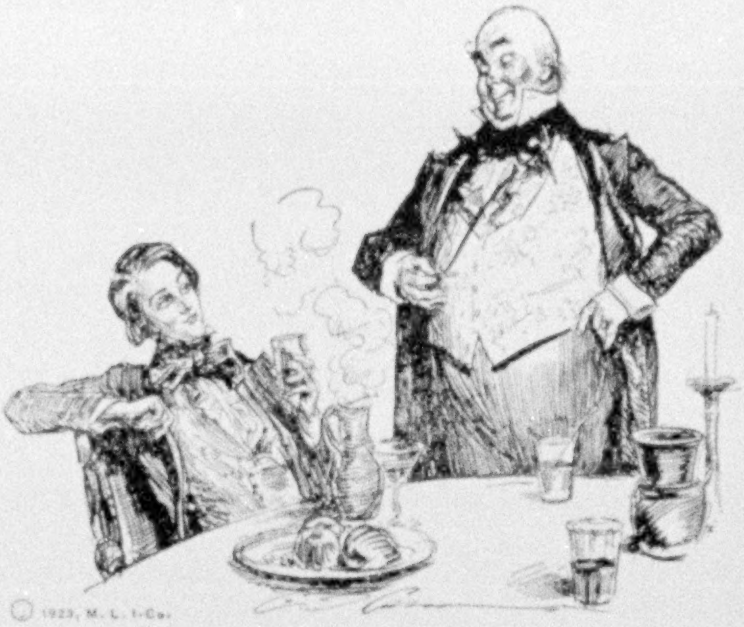
MATSON NAVIGATION CO.
205 MARKET ST., SAN FRANCISCO

*Name*________________

*Address*________________

Are you a micawber?

MEET an old friend—Mr. Wilkins Micawber! First introduced to you by Charles Dickens in "David Copperfield". Always procrastinating, always out of money, always *"waiting for something to turn up"*. And yet such a good fellow in so many ways.



"My other piece of advice, Copperfield, you know. Annual income twenty pounds, annual expenditure, nineteen nineteen six result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery."

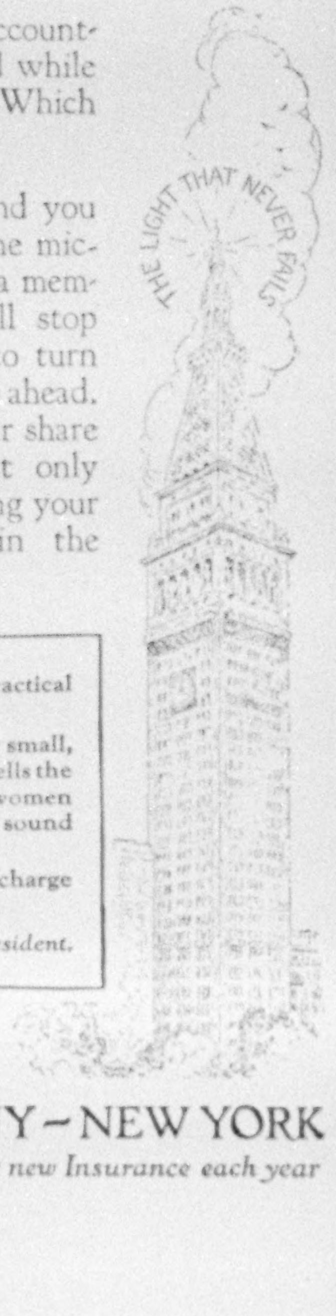
Nevertheless your sympathy went out to his trusting, never-deserting wife and their five children. And today you have only to look about you in every city, town and village—in every office, shop or factory—to see how this little family has multiplied thousands and millions of times. You meet its descendents everywhere.

A micawber is the person who hasn't a penny in the bank, a share in the building and loan association, an interest in any benefit fund or a dollar's worth of life insurance. A micawber is a person who hasn't saved a cent.

CHARLES DICKENS put the word, *micawber*, into the English language seventy-five years ago. Straight-thinking economists put the word, *budget*, into it eighty-eight years before that.

Micawbers prefer to spend what they have and wait for "something to turn up". No limitations of a budget for them! Yet the strange part of it is this: It isn't a *budget* that holds your scale of living down; it's your *income*. In fact, budgeting your expense is a real incentive to increase your income, as well as the best way to get the very most out of what you have now. It tells you just where your money is going, *before it goes instead of afterwards*. The difference between budgeting and accounting is that one looks ahead while the other looks back. Which way do you wish to look?

Get on a budget basis and you will step up and out of the micawber family—if you are a member of it now. You will stop waiting for "something to turn up." You will begin to go ahead. You will begin to get your share of the good things that only savings can buy, including your financial independence in the years to come.


THE LIGHT THAT NEVER FAILS

The Metropolitan Life Insurance Company has an intimate financial relationship with more than 20,000,000 policy-holders. In this friendly contact with one-sixth of the population of the U. S. and Canada, it has come to know how great a need exists for a definite, simple plan of saving.

Most people would like to save if they knew how. But the question usually is—*"How can I save on my income?"* To answer this question, the Metropolitan has worked out a simple, practical plan for budgeting one's income.

It shows practical budgets worked out for small, medium and generous incomes. And it tells the true and inspiring stories of many men and women who have learned to save—true stories that sound like fairy tales.

On your request, we will mail you free of charge a copy of this booklet, "Let Budget Help".

HALEY FISKE, *President.*

Published by

METROPOLITAN LIFE INSURANCE COMPANY—NEW YORK

Biggest in the World, More Assets, More Policyholders, More Insurance in force, More new Insurance each year

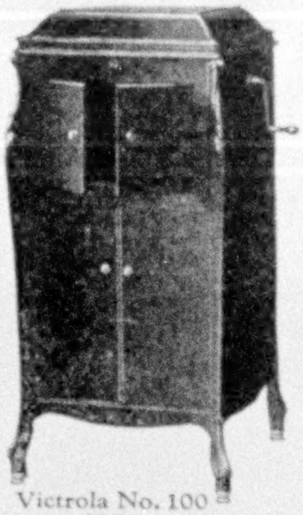
XUM

© Davis & Sanford

PADEREWSKI
Victor Artist

Nothing short of perfection satisfies the artistic sense of this great artist. The eighteen selections by Paderewski already listed in the Victor catalog have all had his personal approval. Among these numbers are:

	Double-faced	
Hungarian Rhapsody, No. 2—Part I Hungarian Rhapsody, No. 2—Part II	6235	$2.00
Valse in A Flat Cracovienne Fantastique	6230	2.00



Victrola No. 100
$150
Mahogany, oak or walnut

© Mishkin

MELBA
Victor Artist

The first records Melba ever made were to send to her father in Australia. So perfectly did they reproduce her voice that she continued to make Victor Records. Her repertoire of twenty-six numbers includes:

	Double-faced	
Lo, Here the Gentle Lark Pensieroso—Sweet Bird	6214	$2.00
Rigoletto—Caro nome Traviata—Ah, fors' è lui	6213	2.00
Don César de Basan—Sevillana Louise—Depuis le jour	6216	2.00

Victrola No. 240
$125
Mahogany, oak or walnut

© Dupont

KREISLER
Victor Artist

Kreisler's mastery of the violin is as evident on the Victrola as on the concert stage. Kreisler knows this and his seventy-two Victor records confirm his judgment. A few of these records are:

	Double-faced	
Chanson Indoue Chanson Arabe	706	$1.50
Caprice Viennois Humoresque	6181	2.00
Souvenir Chanson sans paroles	716	1.50

Victrola No. 215
$150
Mahogany, oak or walnut

The Victor Company originated the modern talking machine and was the first to offer the public high-class music by great artists. Victor Supremacy began then. It has been maintained by the continuing patronage of the world's greatest musicians and by the merit of Victor Products.

In buying a talking machine, consider that you must choose the Victrola or something you hope will do as well, and remember that the Victrola—the standard by which all are judged—costs no more. The Victrola instrument line includes twenty-one models of the three general types shown at from $25 up. Ask your dealer or write to us for illustrated catalog.

To be sure of Victor Products, see the following trade-marks—under the lid of every instrument and on the label of every record.

"HIS MASTER'S VOICE"

Victrola

Look under the lid and on the labels for these Victor trade-marks
Victor Talking Machine Company, Camden, N. J.

VOL. XLV, No. 3 WASHINGTON MARCH, 1924

THE NATIONAL GEOGRAPHIC MAGAZINE

COPYRIGHT, 1924, BY NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON, D. C., IN THE UNITED STATES AND GREAT BRITAIN

GEOGRAPHY AND SOME EXPLORERS

By Joseph Conrad

IT IS safe to say that for the majority of mankind the superiority of geography over geometry lies in the appeal of its figures. It may be an effect of the incorrigible frivolity inherent in human nature, but most of us will agree that a map is more fascinating to look at than a figure in a treatise on conic section—at any rate, for the simple minds which are the equipment of the majority of the dwellers on this earth.

No doubt a trigonometrical survey may be a romantic undertaking, striding over deserts and leaping over valleys never before trodden by the foot of civilized man; but its accurate operations can never have for us the fascination of the first hazardous steps of a venturesome, often lonely, explorer jotting down by the light of his camp fire the thoughts, the impressions, and the toil of his day.

For a long time yet, a few suggestive words grappling with things seen will have the advantage over a long array of precise, no doubt interesting, and even profitable figures. The earth is a stage, and though it may be an advantage, even to the right comprehension of the play, to know its exact configuration, it is always the drama of human endeavor that will be the thing, with a ruling passion expressed by outward action marching perhaps blindly to success or failure, which themselves are often undistinguishable from each other at first.

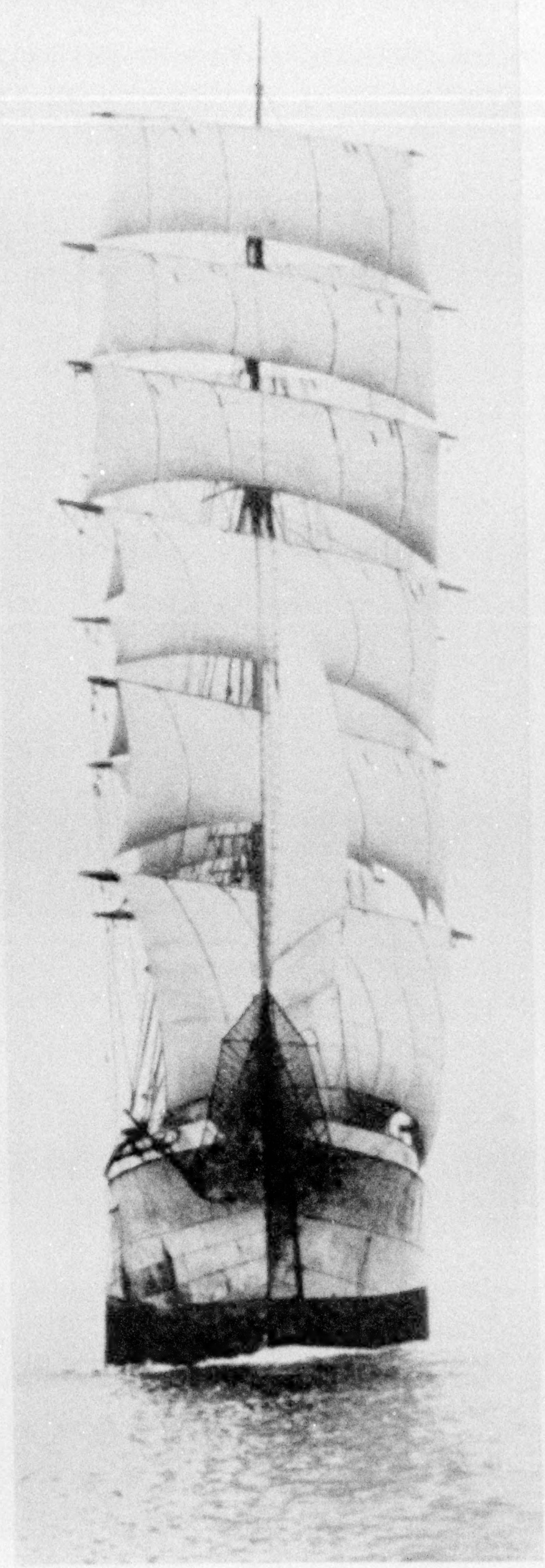
GEOGRAPHY IS THE SCIENCE OF ACTION

Of all the sciences, geography finds its origin in action, and, what is more, in adventurous action, of the kind that appeals to sedentary people, who like to dream of arduous adventure in the manner of prisoners dreaming behind their bars of all the hardships and hazards of liberty, dear to the heart of man.

Descriptive geography, like any other kind of science, has been built on the experience of certain phenomena and on experiments prompted by that unappeasable curiosity of men which their intelligence has elevated into a quite respectable passion for acquiring knowledge. Like other sciences, it has fought its way to truth through a long series of errors. It has suffered from the love of the marvelous, from our credulity, from rash and unwarrantable assumptions, from the play of unbridled fancy.

Geography had its phase of circumstantially extravagant speculation which had nothing to do with the pursuit of truth, but has given us a curious glimpse of the medieval mind playing in its ponderous, childish way with the problems of our earth's shape, its size, its character, its products, its inhabitants.

Cartography was almost as pictorial then as some modern newspapers. It crowded its maps with pictures of strange pageants, strange trees, strange beasts, drawn with amazing precision in the midst of theoretically conceived continents. It delineated imaginary kingdoms of Monomotapa and of Prester John, the regions infested by lions or haunted by unicorns, inhabited by men with reversed feet or eyes in the middle of their breasts.



AN ALLY OF GEOGRAPHY MILITANT

The four-masted square-rigged *Nercos* under full sail. "The unchangeable sea preserves the memory of things accomplished by wisdom and daring among its restless waves" (see text, page 272).

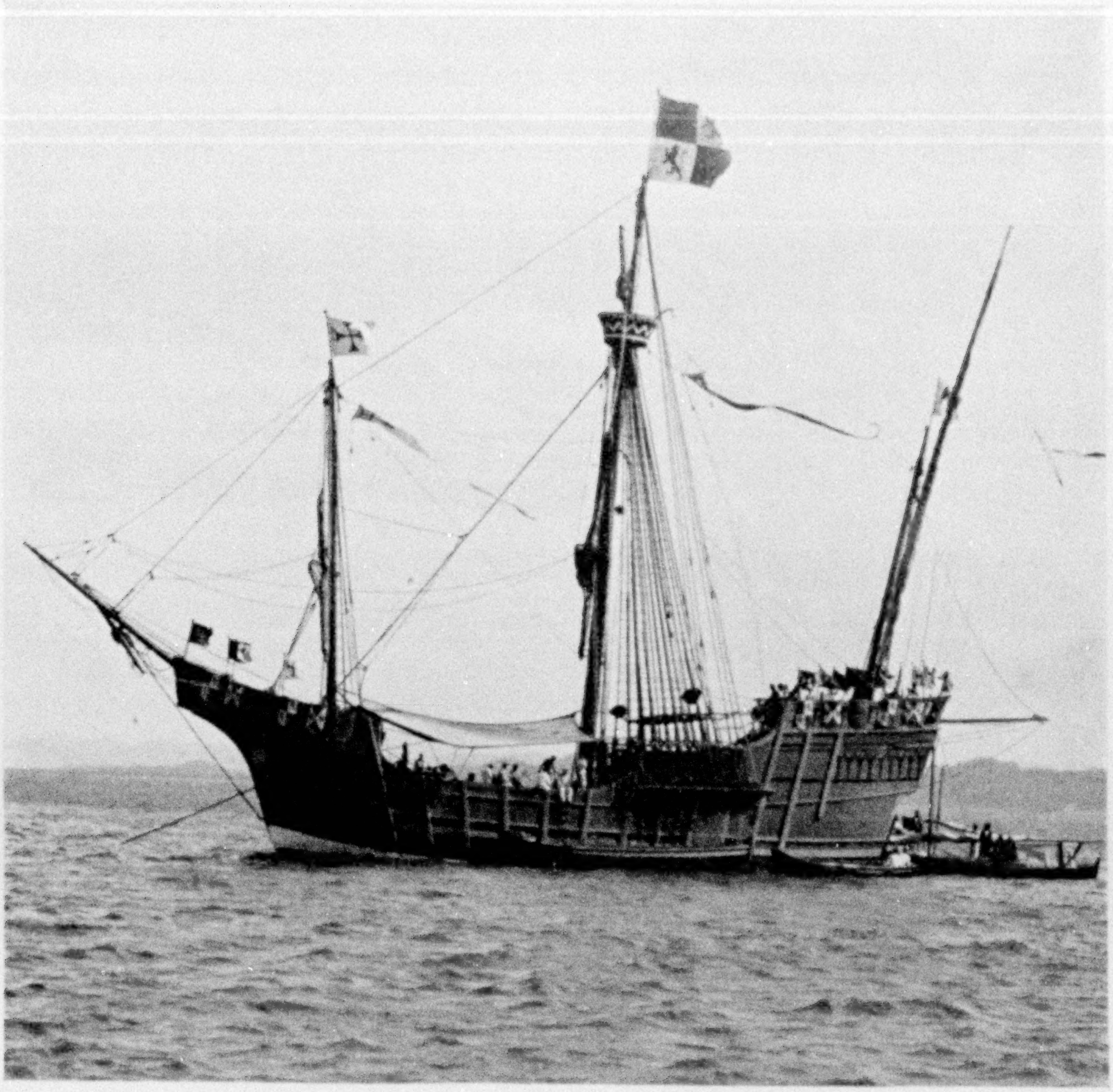
All this might have been amusing if the medieval gravity in the absurd had not been in itself a wearisome thing. But what of that! Has not the key science of modern chemistry passed through its dishonest phase of alchemy (a portentous development of the confidence-trick), and our knowledge of the starry sky been arrived at through the superstitious idealism of astrology looking for men's fate in the depths of the infinite! Mere megalomania on a colossal scale. Yet, solemn fooling for solemn fooling of the scientific order, I prefer the kind that does not lay itself out to thrive on the fears and the cupidities of men.

THE GREATEST GEOGRAPHER OF ALL TIMES WAS REWARDED WITH CHAINS

From that point of view geography is the most blameless of sciences. Its fabulous phase never aimed at cheating simple mortals (who are a multitude) out of their peace of mind or their money. At the most, it has enticed some of them away from their homes—to death, maybe; now and then to a little disputed glory, not seldom to contumely, never to high fortune. The greatest of them all, who has presented modern geography with a new world to work upon, was at one time loaded with chains and thrown into prison.

Columbus remains a pathetic figure, not a sufferer in the cause of geography, but a victim of the imperfections of jealous human hearts, accepting his fate with resignation. Among explorers, he appears lofty in his troubles and like a man of a kingly nature. His contribution to the knowledge of the earth was certainly royal.

And if the discovery of America was the occasion of the greatest outburst of reckless cruelty and greed known to history, we may say this, at least, for it, that the gold of Mexico and Peru, unlike the gold of alchemists, was really there—palpable, yet, as ever, the most elusive of the Fata Morgana that lure men away from their homes—as a moment of reflection will convince any one; for nothing is more certain than that there will never be enough gold to go round, as the Conquistadores found out by experience.



Photograph from N. H. Darton

A REPRODUCTION OF COLUMBUS' FLAGSHIP, THE "SANTA MARIA"

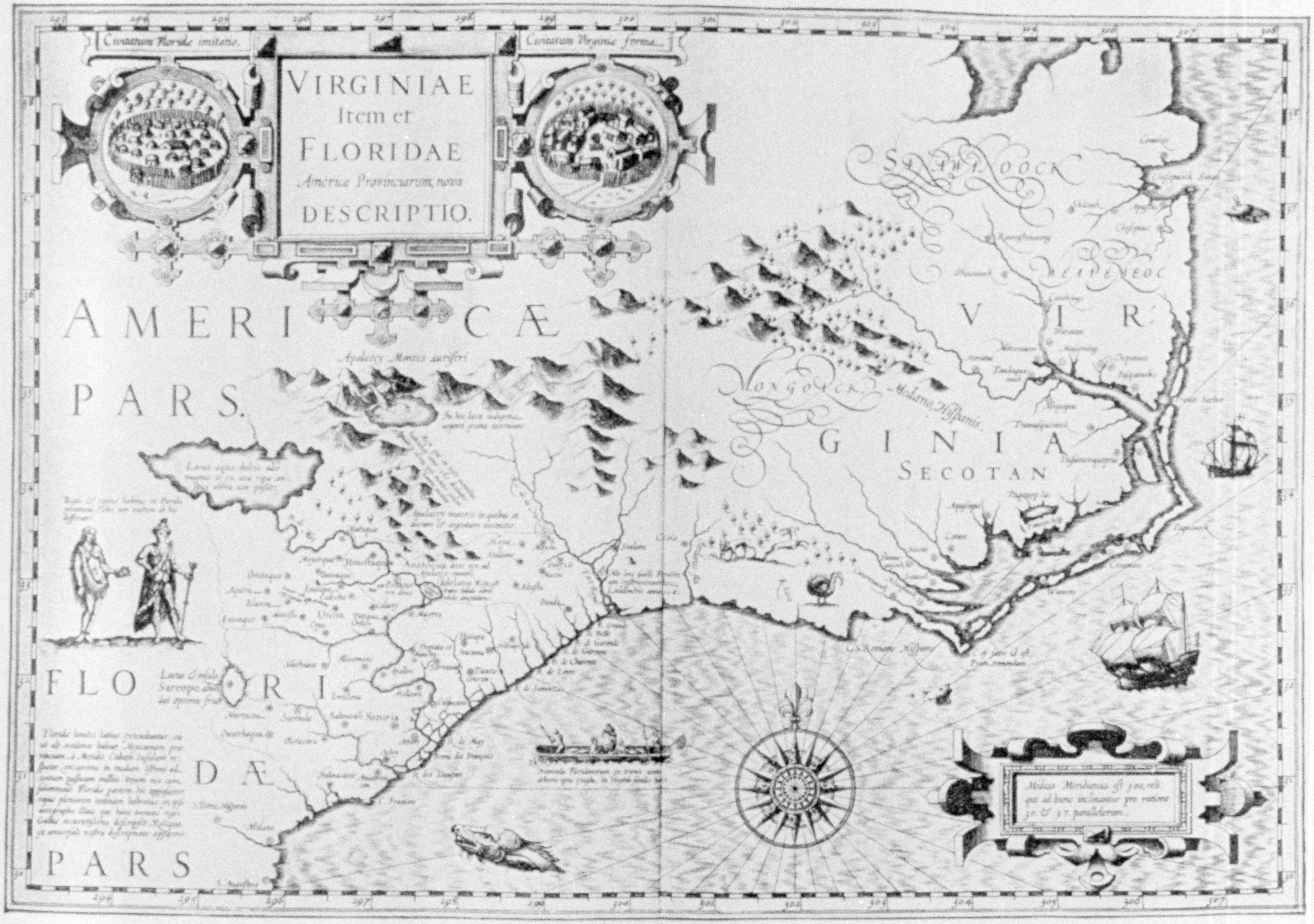
"The greatest explorer of them all has presented modern geography with a new world to work upon" (see text, page 240).

I suppose it is not very charitable of me, but I must say that to this day I feel a malicious pleasure at the many disappointments of those pertinacious searchers for El Dorado who climbed mountains, pushed through forests, swam rivers, floundered in bogs, without giving a single thought to the science of geography.

Not for them the serene joys of scientific research, but infinite toil, in hunger, thirst, sickness, battle; with broken heads, unseemly squabbles, and empty pockets in the end. I cannot help thinking it served them right. It is an ugly tale, which has not much to do with the service of geography.

The geographical knowledge of our day is of the kind that would have been beyond the conception of the hardy followers of Cortez and Pizarro, and of that most estimable of conquerors who was called Cabeza de Vaca, who was high-minded and dealt humanely with the heathen nations whose territories he traversed in search of one more El Dorado. It is said they loved him greatly; but now the very memory of those nations is gone from the earth, while their territories, which they could not take with them, are being traversed many times every twenty-four hours by the trains of the Southern Pacific Railroad.

XUM


Civitatum Floridæ imitatio.
Civitatum Virginiæ forma.
VIRGINIAE Item et FLORIDAE Americæ Provinciarum, nova DESCRIPTIO.
AMERICÆ PARS.
Apalatcy Montes auriferi
VIRGINIA
SECOTAN
MONGOACK
FLORIDÆ PARS
Chesepeack Sinus
Medius Meridianus est 300, reliqui ad hunc inclinantur pro ratione 30. & 37. parallelorum.

MAP OF VIRGINIA AND FLORIDA, FROM AN AMSTERDAM ATLAS OF THE WORLD PUBLISHED IN 1638

"Cartography was almost as pictorial then as some modern newspapers" (see text, page 239). Note the two types of sea serpents depicted by this seventeenth century map maker. "The king and queen of the Province of Florida" are shown in their royal robes at the left. The "Apalatcy" Mountains are labeled as gold-bearing and the large lake at their base is said to yield silver. Models of fortified posts in Virginia and Florida are shown in the upper left corner.

The discovery of the New World marks the end of the fabulous geography, and it must be owned that the history of the conquest contains at least one great moment—I mean a geographically great moment—when Vasco Nuñez de Balboa, while crossing the Isthmus of Panama, set his eyes for the first time upon the ocean the immensity of which he did not suspect and which in his elation he named the Pacific. It is anything but that; but the privileged Conquistador cannot be blamed for surrendering to his first impression.

The Gulf of Panama, which is what he really saw with that first glance, is one of the calmest spots on the waters of the globe. Too calm. The old navigators dreaded it as a dangerous region, where one might be caught and lie becalmed for weeks, with one's crew dying slowly of thirst, under a cloudless sky. The worst of fates, this, to feel yourself die in a long and helpless agony. How much preferable a region of storms, where man and ship can at least put up a fight and remain defiant almost to the last.

I must not be understood to mean that a tempest at sea is a delightful experience, but I would rather face the fiercest tempest than a gulf pacific even to deadliness, a prison-house for incautious caravels and a place of torture for their crews.

But Balboa was charmed with its serene aspect. He did not know where he was. He probably thought himself within a stone's throw, as it were, of the Indies and Cathay.

Or did he, perhaps, like a man touched with grace, have a moment of exalted vision, the awed feeling that what he was looking at was an abyss of waters comparable in its extent to the view of the unfathomable firmament, and sown all over with groups of islands resembling the constellations of the sky?

EARLY GEOGRAPHERS SOUGHT IN VAIN FOR GREAT SOUTHERN CONTINENT

But, whatever spiritual glimpse of the truth he might have had, Balboa could not possibly know that this great moment of his life had added suddenly thousands of miles to the circumference of the globe, had opened an immense theater for the human drama of adventure and exploration, a field for missionary labors, and spread an enormous canvas on which some geographers could paint the most fanciful variants of their pet theory of a great southern continent.

I will not quarrel with the post-Columbian cartographers for their wild but upon the whole interesting inventions. The provocation to let oneself go was considerable.

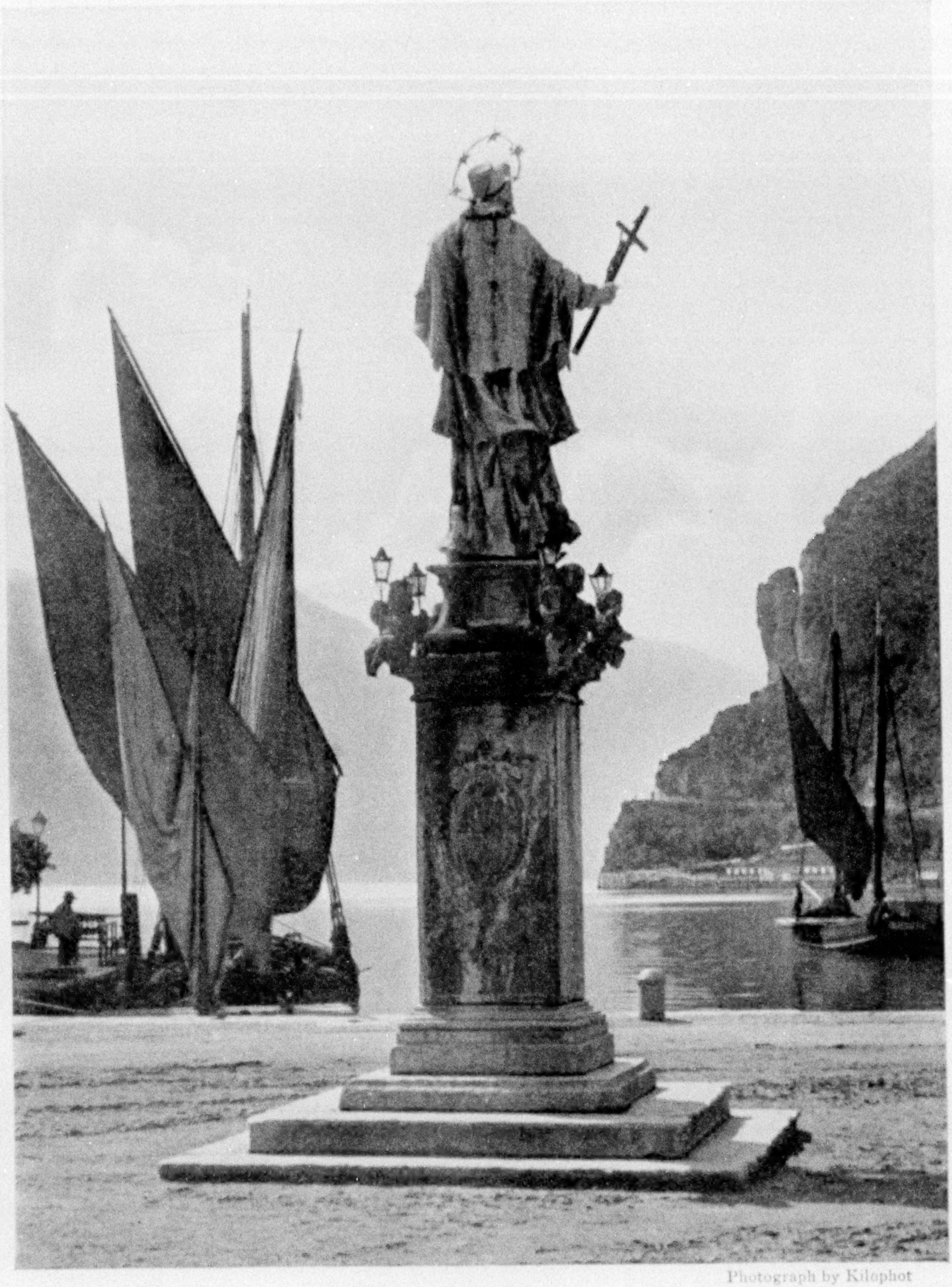
Geography militant, which had succeeded the geography fabulous, did not seem able to accept the idea that there was much more water than land on this globe. Nothing could satisfy their sense of the fitness of things but an enormous extent of solid earth, which they placed in that region of the south where, as a matter of fact, the great white-crested seas of stormy latitudes will be free to chase each other all round the globe to the end of time.

I suppose their landsmen's temperament stood in the way of their recognition that the world of geography, as far as the apportioning of space goes, seems to have been planned mostly for the convenience of fishes.

TASMAN THOUGHT HE HAD FOUND THE CONTINENT

What is surprising to me is that the seamen of the time should have really believed that the large continents to the north of the Equator demanded, as a matter of good art or else of sound science, to be balanced by corresponding masses of land in the southern hemisphere. They were simple souls. The chorus of people all singing the same tune made them blind to the many plain signs of a great open sea. Every bit of coastline discovered, every mountain top glimpsed in the distance, had to be dragged loyally into the scheme of the Terra Australis Incognita.

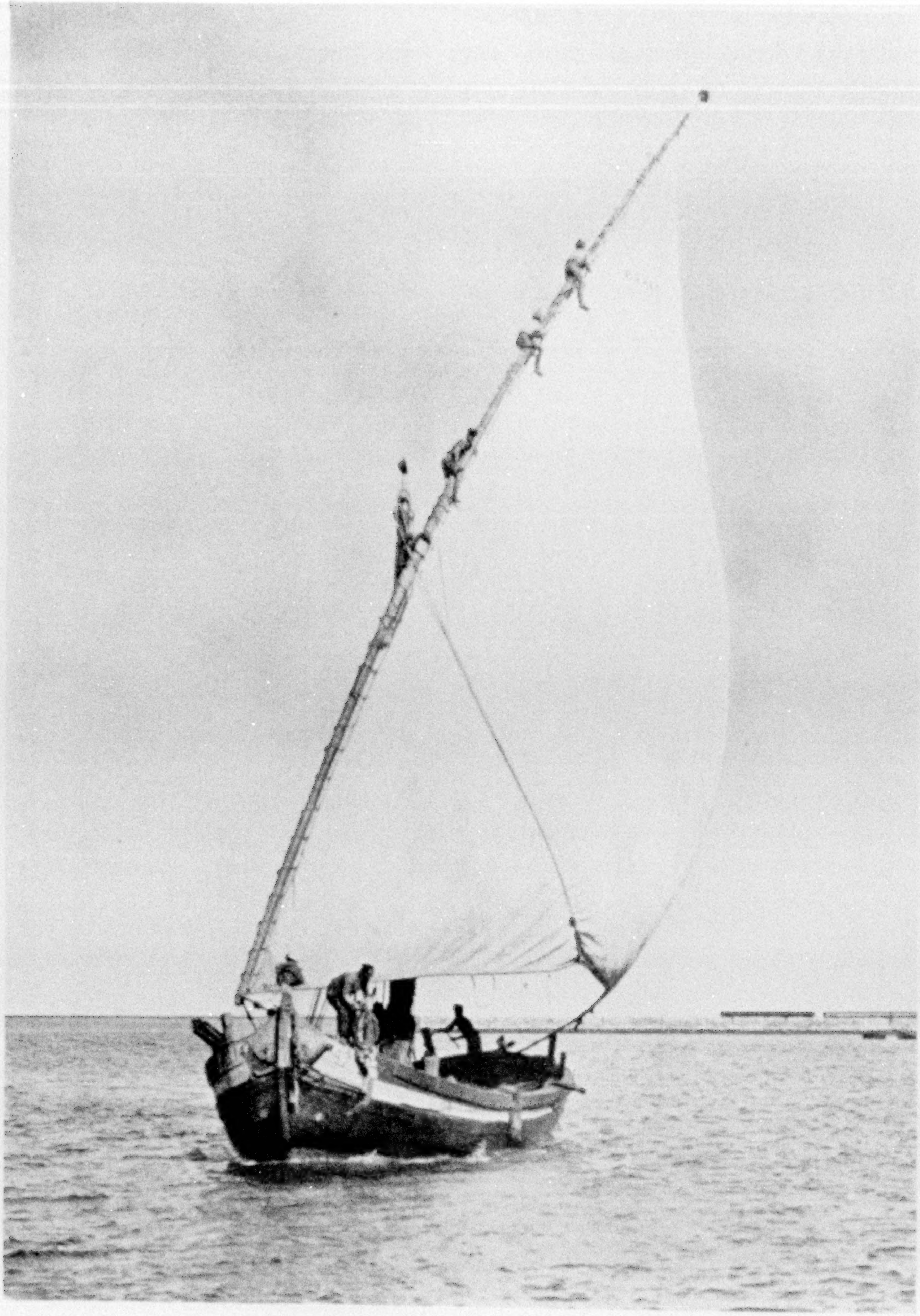
Even Tasman, the best seaman of them all before James Cook, the most accomplished of seventeenth century explorers and navigators, that went forth to settle the geography of the Pacific—even Tasman, after coming unexpectedly upon the North Island of New Zealand, and lingering long enough there to chart roughly a bit of the coast and lose a boat's crew in a sudden affray with the Maoris, seemed to take it for granted that this was the western limit of an enormous



Photograph by Kilophot

ST. JOHN OF NEPOMUK, PATRON SAINT OF THOSE WHO FACE DANGER BY WATER

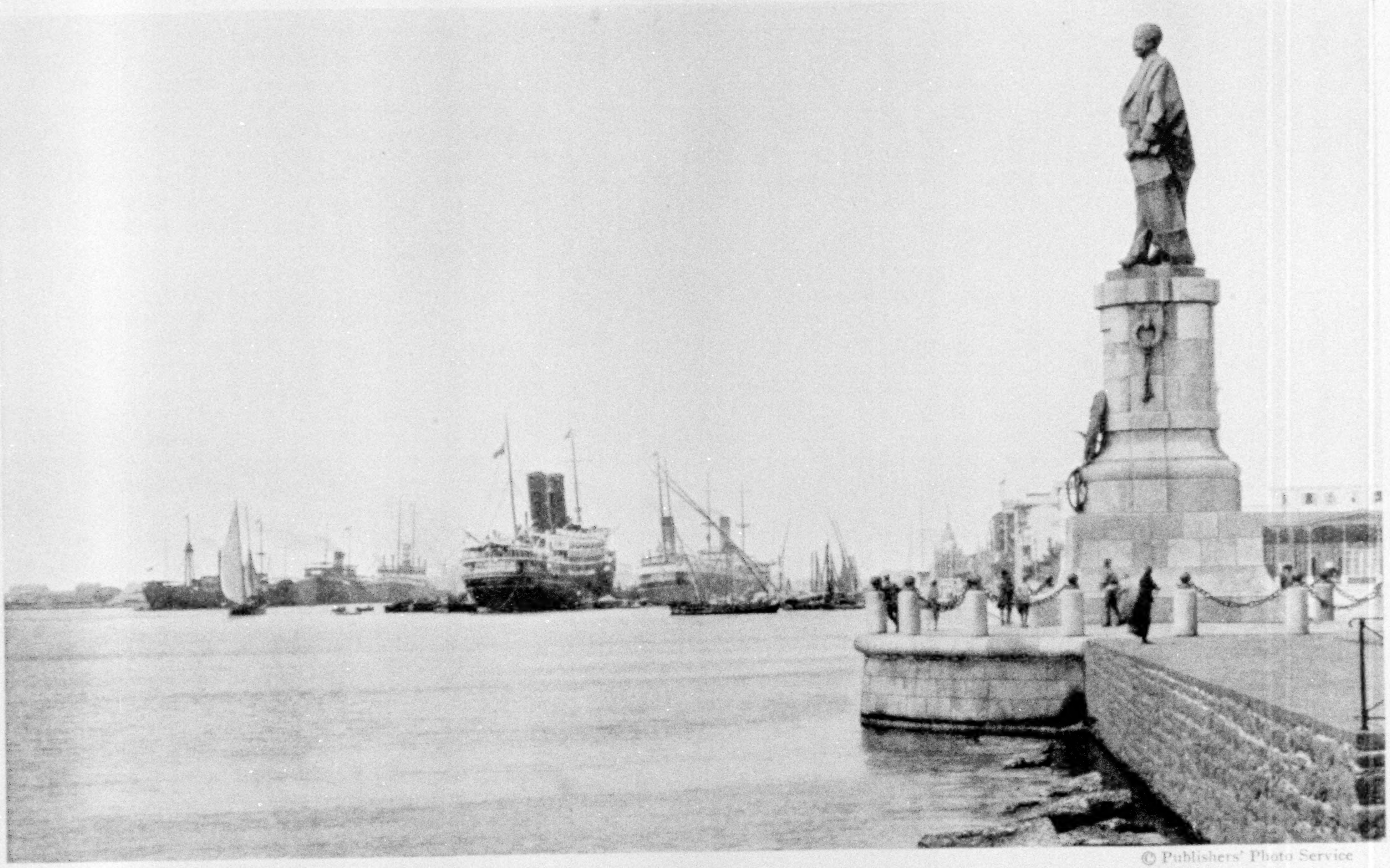
This statue overlooks the harbor of Riva, on Lake Garda, northern Italy.



Photograph by Maynard Owen Williams

A FISHING BOAT AT PORT SAID

The craft is manned by Italians from Bari, three of whom have gone aloft to furl the sail.



© Publishers' Photo Service

ENTRANCE TO THE SUEZ CANAL, WITH THE STATUE OF FERDINAND DE LESSEPS TO THE RIGHT

The French diplomatist de Lesseps, then 27 years of age, conceived the idea of the Suez Canal while his vessel was held in quarantine at Alexandria in 1832. Twenty-seven years later at Port Said he struck the first blow with a pickax, which finally resulted in the completion of the short water route to the Far East in 1869, thus supplanting Vasco de Gama's route to the Indies around Cape of Good Hope.

continent extending away toward the point of South America.

Mighty is the power of a theory, especially if based on such a common-sense notion as the balance of continents. And it must be remembered that it is difficult for us now to realize not only the navigational dangers of unknown seas, but the awful geographical incertitudes of the first explorers in that new world of waters.

Tasman's journal, which has been published not so very long ago, gives us some idea of their perplexing difficulties. The early navigators had no means of ascertaining their exact position on the globe. They could calculate their latitude, but the problem of longitude was a matter which bewildered their minds and often falsified their judgment. It had to be a matter of pure guesswork.

TASMAN CENSURED BY HIS EMPLOYERS

Tasman and his officers, when they met on board the *Heemskirk*, anchored in Murderers' Bay, to consider their further course in the light of their instructions, did not know where any of the problematic places named in their instructions were; neither did they know where they themselves were.

Tasman might have sailed north or east, but in the end he decided to sail between the two, and, circling about, returned to Batavia, was received coldly by his employers, the honorable governor-general and the council in Batavia. Their final judgment was that Abel Tasman was a skillful navigator, but that he had shown himself "remiss" in his investigations, and that he had been guilty of leaving certain problems unsolved.

We are told that Tasman did not expect this criticism; and indeed, even now, it seems surprising to an unprejudiced mind. It was the voyage during which, among other things, Tasman discovered the island by which his name lives on the charts, took first contact with New Zealand (which was not seen again till 130 years afterwards), sailed over many thousands of miles of uncharted seas, bringing back with him a journal which was of much value afterwards for his exploring successors.

It may be he was hurt by the verdict of the honorable council, but he does not seem to have been cast down by it, for it appears that shortly afterwards he asked for a rise of salary and, what is still more significant, he got it. He was obviously a valuable servant, but I am sorry to say that his character as a man was not of the kind to cause governors and councils to treat him with particular consideration.

Except in professional achievement, he is not comparable to Captain Cook, a humble son of the soil like himself, but a modest man of genius, the familiar associate of the most learned in the land, medalist of the Royal Society and a captain in the Royal Navy.

But there was a taint of an unscrupulous adventurer in Tasman. It is certain that at various times his patron, the Governor Anthony Van Diemen, and the honorable council in Batavia had employed him in some shady transactions of their own connected with the Japan trade.

There is also no doubt that once he had, on his own responsibility, kidnapped an influential Chinaman who stood in the way of some business negotiation Tasman was conducting with the Sultan of Achin. The Chinaman may have been a worthless person, but one wonders what happened to him in the end; and in any case the proceeding is open to criticism.

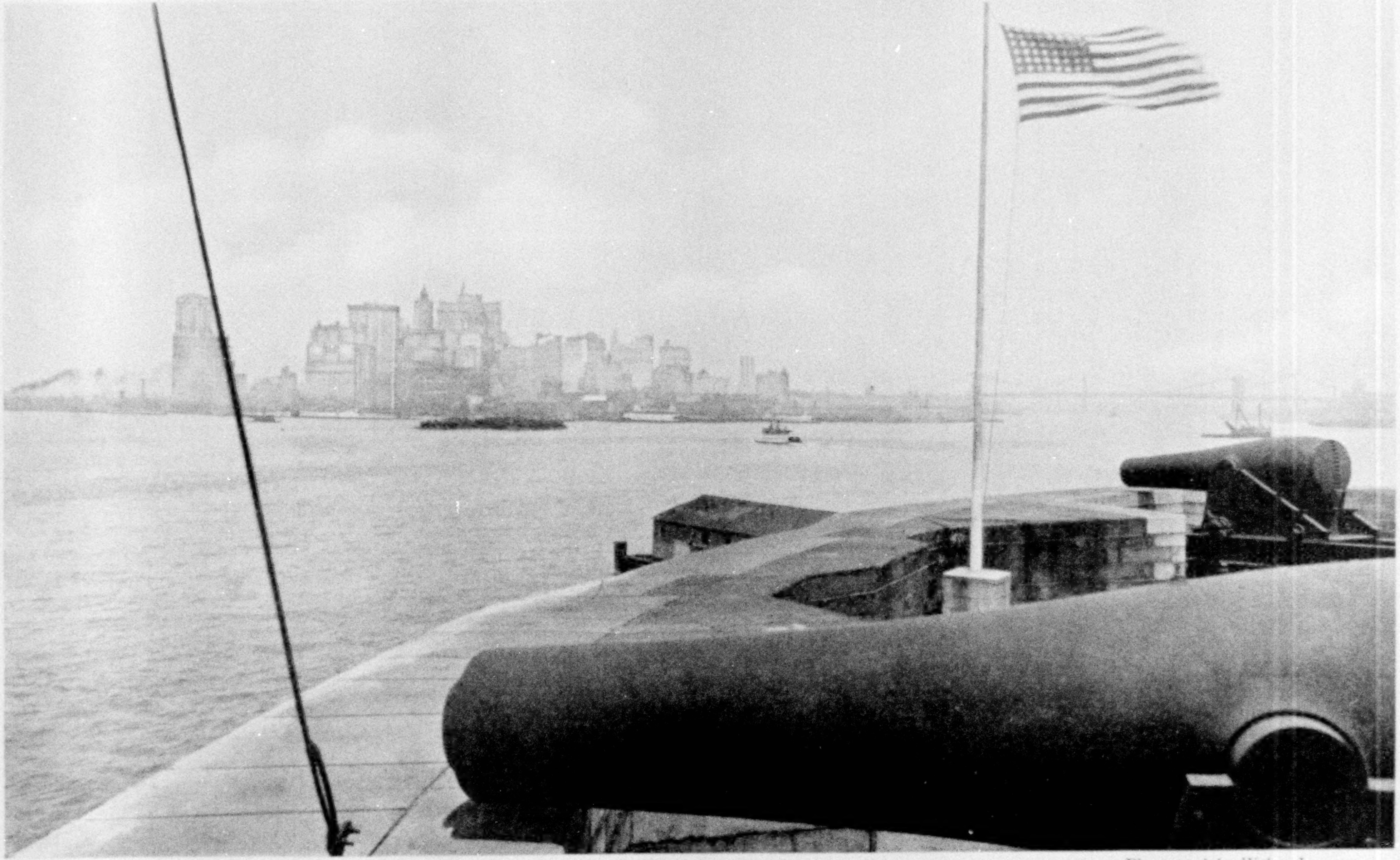
Then in his old age Tasman got into some disreputable scrape which caused the congregation with which he worshiped to ask him to resign his membership. Even the honorable council was startled and dismissed him from his employment, though characteristically enough not actually from their service. This action of the council fixes the character of the man better than any scandalous story. He was valuable, but compromising.

CAPTAIN COOK LAID THE GHOST OF TERRA AUSTRALIS INCOGNITA

All those regrettable details came to my knowledge quite recently in a very amusing and interesting book, but I must confess that my early admiration for Tasman as one of the early fathers of militant geography has not been affected very much by it.

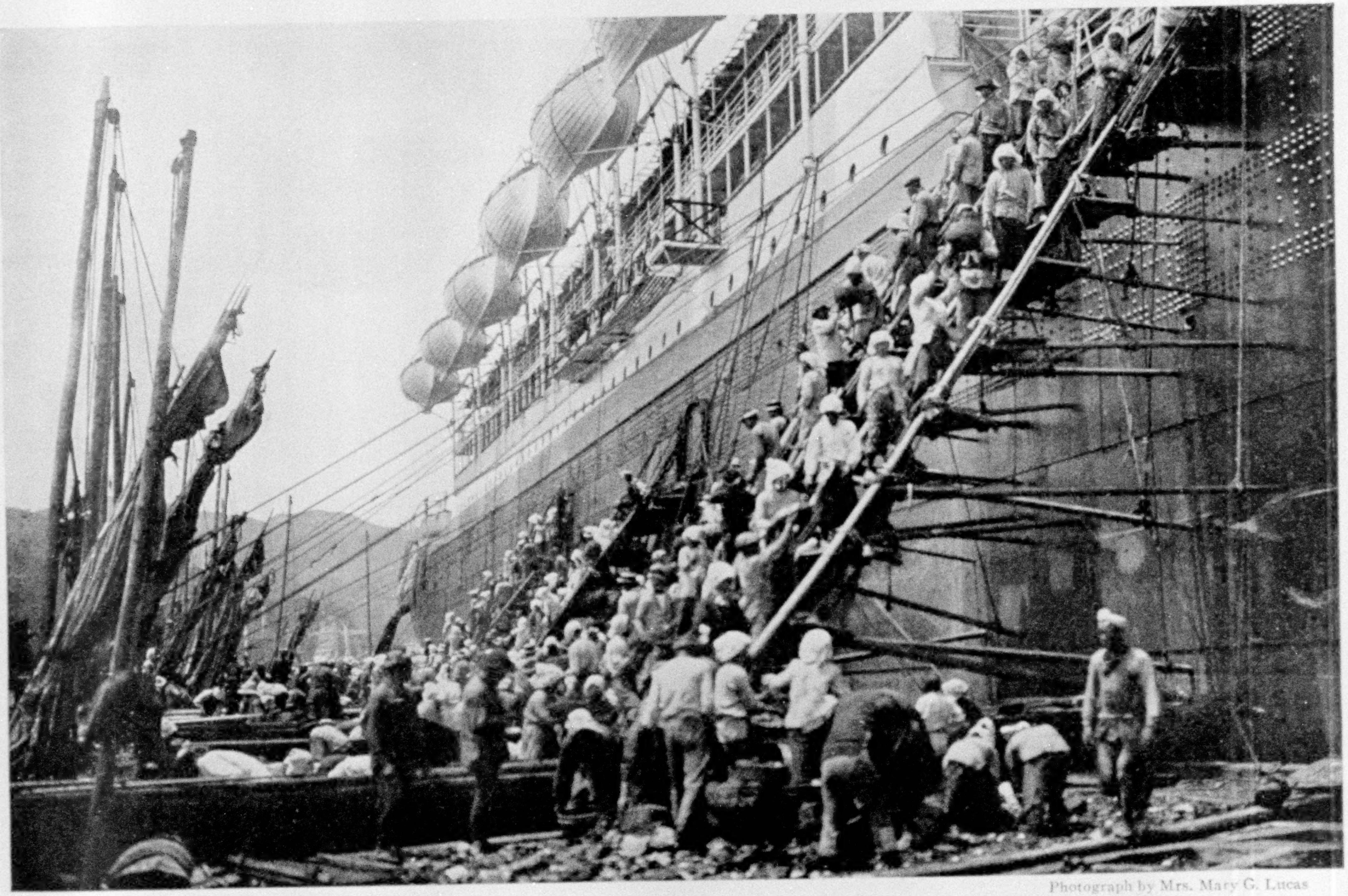
Remiss or not, he had in the course of his voyages mapped 8,000 miles of an island which by common consent is called now a continent, a geologically very old continent indeed, but which is now the

XUM



Photograph by Walter Layman

THE GATEWAY TO THE NEW WORLD: NEW YORK FROM GOVERNORS ISLAND



Photograph by Mrs. Mary G. Lucas

COALING SHIP AT NAGASAKI, THE FIRST PORT OF ENTRY FOR VESSELS COMING FROM THE SOUTH OR THE WEST TO JAPAN

XUM

Photograph from J. W. Beattie

SOUTH SEA ISLAND TRADERS: LA PÉROUSE ARCHIPELAGO

These natives are from Santa Cruz, the chief island of the archipelago named for the great French navigator, La Perouse, who sailed from Botany Bay in 1788 and was not heard of again until the wreckage of his two vessels, the *Boussole* and the *Astrolabe*, was found near here, 38 years later.

home of a very young Commonwealth, with all the possibilities of material and intellectual splendor still hidden in its future.

I like to think that in that portion of the Elysian Fields set apart for great navigators James Cook would not refuse to acknowledge the civilities of Abel Tasman, a fellow-seaman who had first reported the existence of New Zealand in the perplexed bewildered way of those times, a hundred and thirty years before Captain Cook, on his second voyage, laid forever the ghost of the Terra Australis Incognita and added New Zealand to the scientific domain of the geography triumphant of our day.

No shade of remissness nor doubtful motive rests upon the achievements of Captain Cook, who came out of a laborer's cottage to take his place at the head of great masters of maritime exploration who worked at the great geographical problem of the Pacific. *Endeavour* was the name of the ship which carried him on his first voyage, and it was also the watchword of his professional life. *Resolution* was the name of the ship he commanded himself on his second expedition, and it was the determining quality of his soul. I will not say that it was the greatest, because he had all the other manly qualities of a great man.

The voyages of the early explorers

Photograph from Dr. Hugh M. Smith

A NORWEGIAN FISHING BOAT

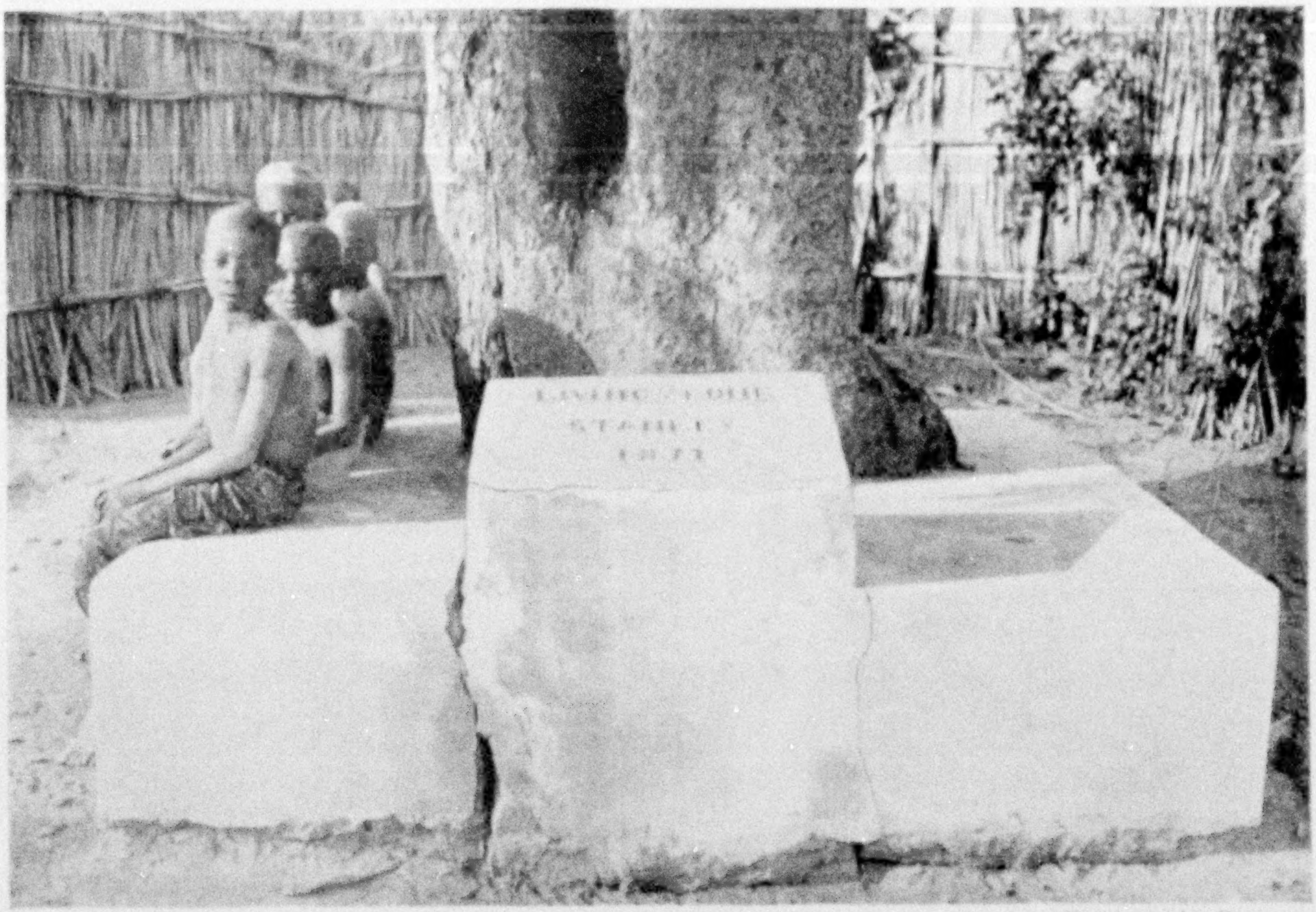
Its lines are suggestive of the boats of the Vikings.

were prompted by an acquisitive spirit, the idea of lucre in some form, the desire of trade or the desire of loot, disguised in more or less fine words. But Cook's three voyages are free from any taint of that sort. His aims needed no disguise. They were scientific. His deeds speak for themselves with the masterly simplicity of a hard-won success.

In that respect he seems to belong to the single-minded explorers of the nineteenth century, the late fathers of militant geography, whose only object was the search for truth. Geography is a science of facts, and they devoted themselves to the discovery of facts in the configuration and features of the great continents.

A GREAT EXPLORER WHO SERVED GEOGRAPHY EVEN IN HIS DEATH

It was the century of landsmen investigators. In saying this I do not forget the polar explorers, whose aims were certainly as pure as the air of those high latitudes where not a few of them laid down their lives for the advancement of geography. Seamen, men of science, it



Photograph by T. Alexander Barns

THE MEMORIAL TABLET WHICH MARKS THE SPOT WHERE STANLEY MET LIVINGSTONE AT UJIJI, ON THE SHORES OF LAKE TANGANYIKA, IN 1871

The mango tree was planted by the two great explorers to commemorate the event, and the memorial was built round it during the occupation of Ujiji by the Belgian troops during the German East African campaign. Unfortunately, the tree is now dying as a result of the cement work, in spite of the fact that the roots have cracked the masonry (see text, page 271).

is difficult to speak of them without admirative emotion.

The dominating figure among the seamen explorers of the first half of the nineteenth century is that of another good man, Sir John Franklin, whose fame rests not only on the extent of his discoveries, but on professional prestige and high personal character.

This great navigator, who never returned home, served geography even in his death. The persistent efforts, extending over ten years, to ascertain his fate advanced greatly our knowledge of the polar regions.

As gradually revealed to the world, this fate appeared the more tragic in this, that for the first two years the way of the *Erebus* and *Terror* expedition seemed to be the way to the desired and important success, while in truth it was all the time the way of death, the end of the greatest drama, perhaps, played behind the curtain of Arctic mystery.

The last words unveiling the mystery of the *Erebus* and *Terror* expedition were brought home and disclosed to the world by Sir Leopold M'Clintock in his book, "The Voyage of the *Fox* in the Arctic Seas."

It is a little book, but it records with manly simplicity the tragic ending of a great tale. It so happened that I was born in the year of its publication. Therefore I may be excused for not getting hold of it till ten years afterwards. I can only account for it falling into my hands by the fact that the fate of Sir John Franklin was a matter of European interest, and that Sir Leopold M'Clintock's book was translated, I believe, into every language of the white races.

My copy was probably in French. But I have read the work many times since. I have now on my shelves a copy of a popular edition got up exactly as I remember my first one.

It contains the touching facsimile of

Photograph from Hon. James G. Whiteley

FISHERMEN AT STANLEY FALLS, BELGIAN CONGO

"I was glad to be alone on deck. . . . The subdued thundering mutter of the Stanley Falls hung in the heavy night air of the last navigable reach of the upper Congo" (see text, page 271).

the printed form filled in with a summary record of the two ships' work, the name of "Sir John Franklin, commanding the expedition," written in ink, and the pathetic underlined entry, "*All well.*" It was found by Sir Leopold M'Clintock under a cairn, and it is dated just a year before the two ships had to be abandoned in their deadly ice-trap and their crews' long and desperate struggle for life began.

There could hardly have been imagined a better book for letting in the breath of the stern romance of polar exploration into the existence of a boy whose knowledge of the poles of the earth had been till then of an abstract, formal kind, as the imaginary ends of the imaginary axis upon which the earth turns.

The great spirit of the realities of the story sent me off on the romantic explorations of my inner self; to the discovery of the taste for poring over land and sea maps; revealed to me the existence of a latent devotion to geography which interfered with my devotion (such as it was) to my other school work.

Unfortunately, the marks awarded for that subject were almost as few as the hours apportioned to it in the school curriculum by persons of no romantic sense for the real, ignorant of the great possibilities of active life; with no desire for struggle, no notion of the wide spaces of the world — mere bored professors, in fact, who were not only middle-aged, but looked to me as if they had never been young.

And their geography was very much like themselves, a bloodless thing, with a dry skin covering a repulsive armature of uninteresting bones.

I would be ashamed of my warmth in digging up a hatchet which has been buried now for nearly fifty years if those fellows had not tried so often to take my scalp at the yearly examinations. There are things that one does not forget.

And, besides, the geography which I had discovered for myself was the geography of open spaces and wide horizons, built up on men's devoted work in the open air, the geography still militant, but already conscious of its approaching end with the death of the last great explorer. The antagonism was radical.

Thus it happened that I got no marks at all for my first and only paper on Arctic geography, which I wrote at the age of thirteen. I still think that for my tender years it was an erudite performance. I certainly did know something of Arctic geography, but what I was after really, I suppose, was the history of Arctic exploration.

My knowledge had considerable gaps, but I managed to compress my enthusiasm into just two pages, which in itself was a sort of merit.

Yet I got no marks. For one thing, it was not a set subject. I believe the only comment made about it to my private tutor was that I seemed to have been wasting my time in reading books of travel instead of attending to my studies.

I tell you, those fellows were always trying to take my scalp. On another occasion I just saved it by proficiency in map drawing. It must have been good, I suppose; but all I remember about it is that it was done in a loving spirit.

MAP-GAZING IS A MORE FASCINATING OCCUPATION THAN STAR-GAZING

I have no doubt that star-gazing is a fine occupation, for it leads you within the borders of the unattainable. But map-gazing, to which I became addicted so early, brings the problems of the great spaces of the earth into stimulating and directive contact with sane curiosity and gives an honest precision to one's imaginative faculty.

And the honest maps of the nineteenth century nourished in me a passionate interest in the truth of geographical facts and a desire for precise knowledge which was extended later to other subjects.

For a change had come over the spirit of cartographers. From the middle of the eighteenth century on, the business of map-making had been growing into an honest occupation, registering the hard-won knowledge, but also, in a scientific spirit, recording the geographical ignorance of its time.

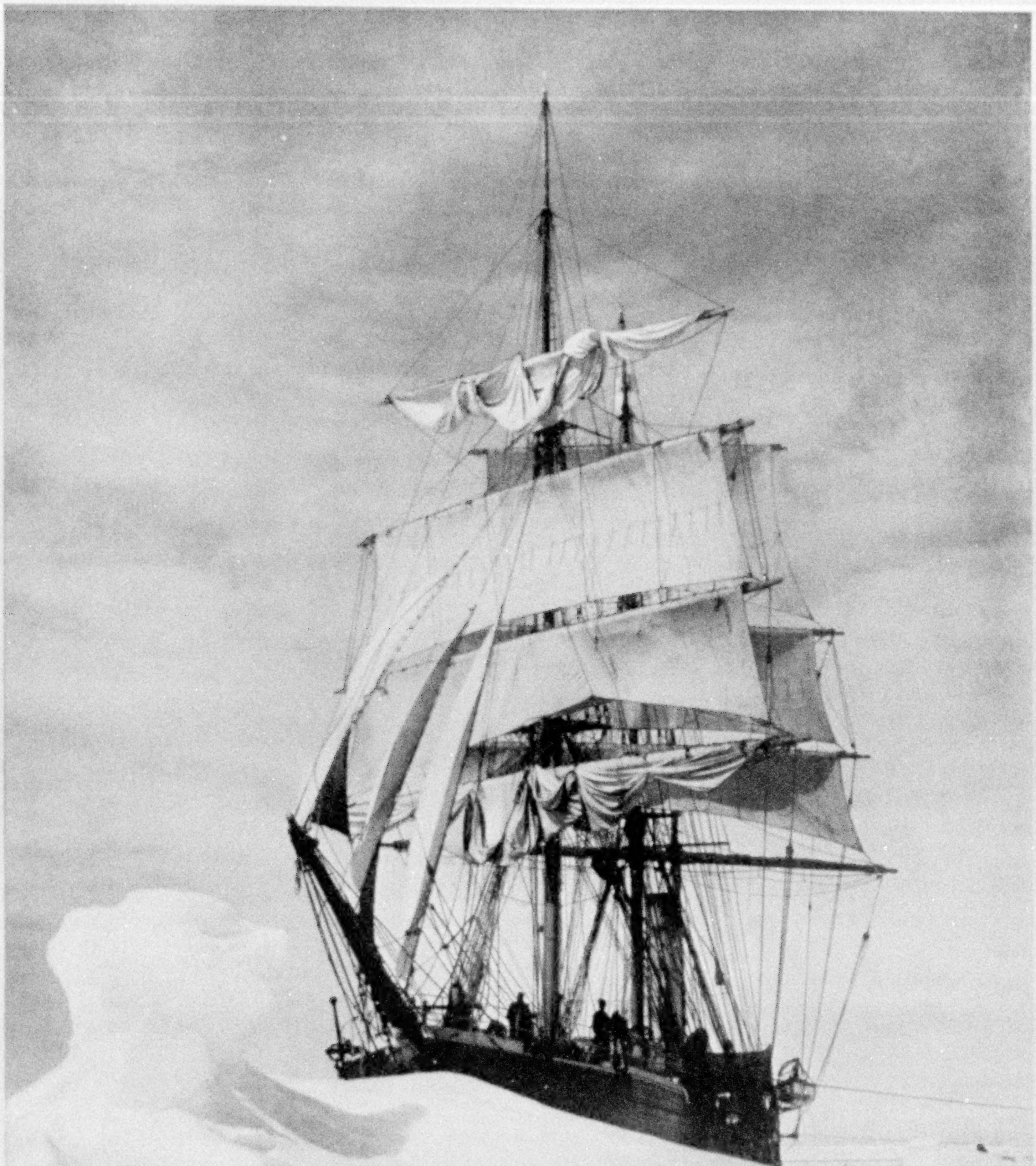
And it was Africa, the continent out of which the Romans used to say some new thing was always coming, that got cleared of the dull imaginary wonders of the Dark Ages, which were replaced by exciting spaces of white paper. Regions unknown! My imagination could depict to itself there worthy, adventurous, and devoted men nibbling at the edges, attacking from north and south and east and west, conquering a bit of truth here and a bit of truth there, and sometimes swallowed up by the mystery their hearts were so persistently set on unveiling.

Among them Mungo Park, of Western Sudan, and Bruce, of Abyssinia, were, I believe, the first friends I made when I began to take notice—I mean geographical notice—of the continents of the world into which I was born. The fame of these two had already been for a long time European, and their figures had become historical by then. But their story was a very novel thing to me; for the very latest geographical news that could have been whispered to me in my cradle was that of the expedition of Burton and Speke, the news of the existence of Tanganyika and of Victoria Nyanza.

I stand here confessed as a contemporary of the Great Lakes of Africa. Yes, I could have heard of their discovery in my cradle, and it was only right that, grown to a boy's estate, I should have in the later sixties done my first bit of map-drawing and paid my first homage to the prestige of their first explorers. It consisted in entering laboriously in pencil the outline of Tanganyika on my beloved old atlas, which, having been published in 1852, knew nothing, of course, of the Great Lakes. The heart of its Africa was white and big.

Surely it could have been nothing but a romantic impulse which prompted the idea of bringing it up to date with all the accuracy of which I was capable. Thus I could imagine myself stepping in the very footprints of geographical discovery.

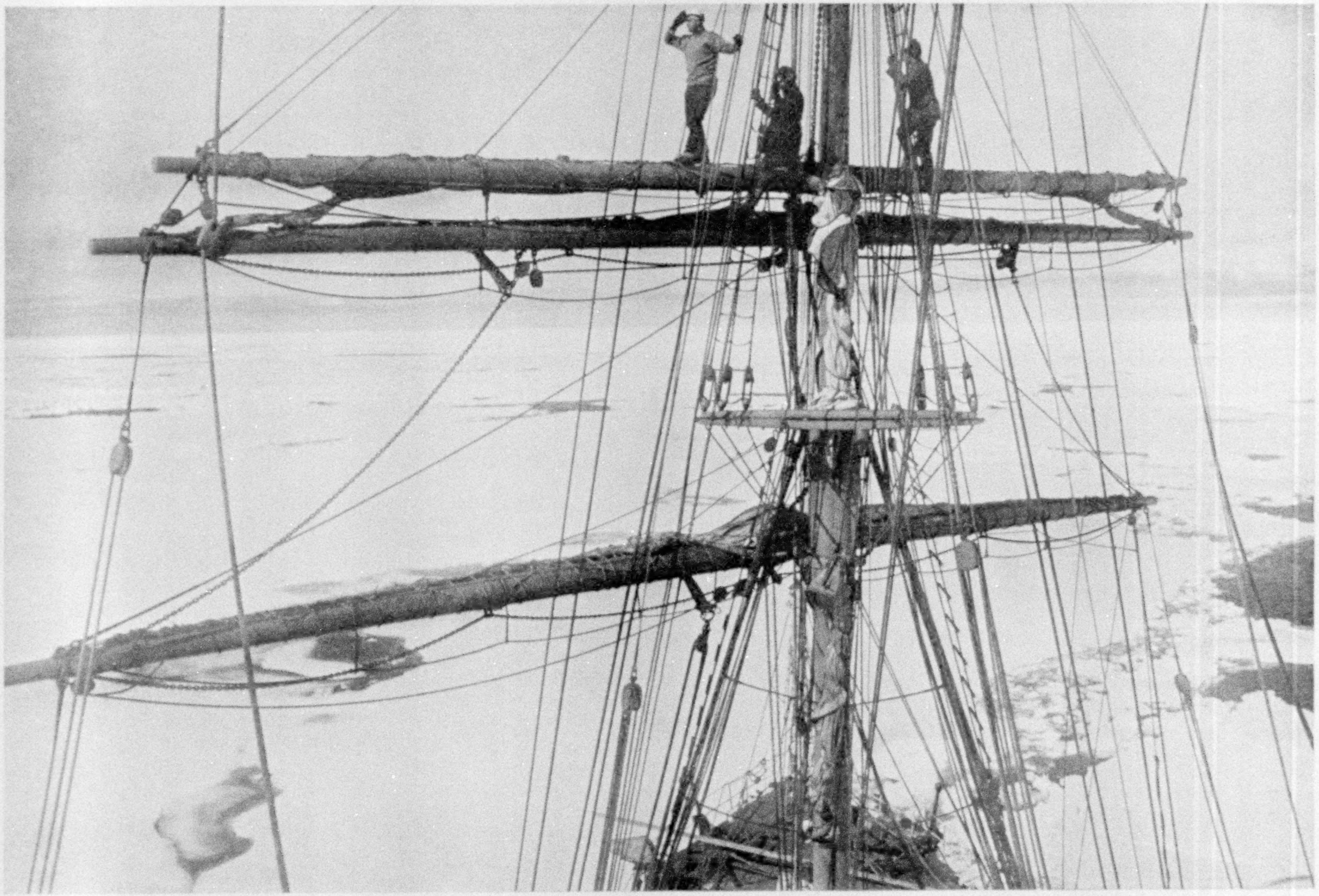
And it was not all wasted time. As a bit of prophetic practice, it was not bad for me. Many years afterwards, as second officer in the Merchant Service, it has been my duty to correct and bring up to date the charts of more than one ship, according to the Admiralty notices. I did this work conscientiously, of course, and with a sense of responsibility; but it was not in the nature of things that I should ever recapture the excitement of



© Herbert G. Ponting

"THE AIMS OF POLAR EXPLORERS HAVE BEEN AS PURE AS THE AIR OF THOSE HIGH LATITUDES" (SEE TEXT, PAGE 251)

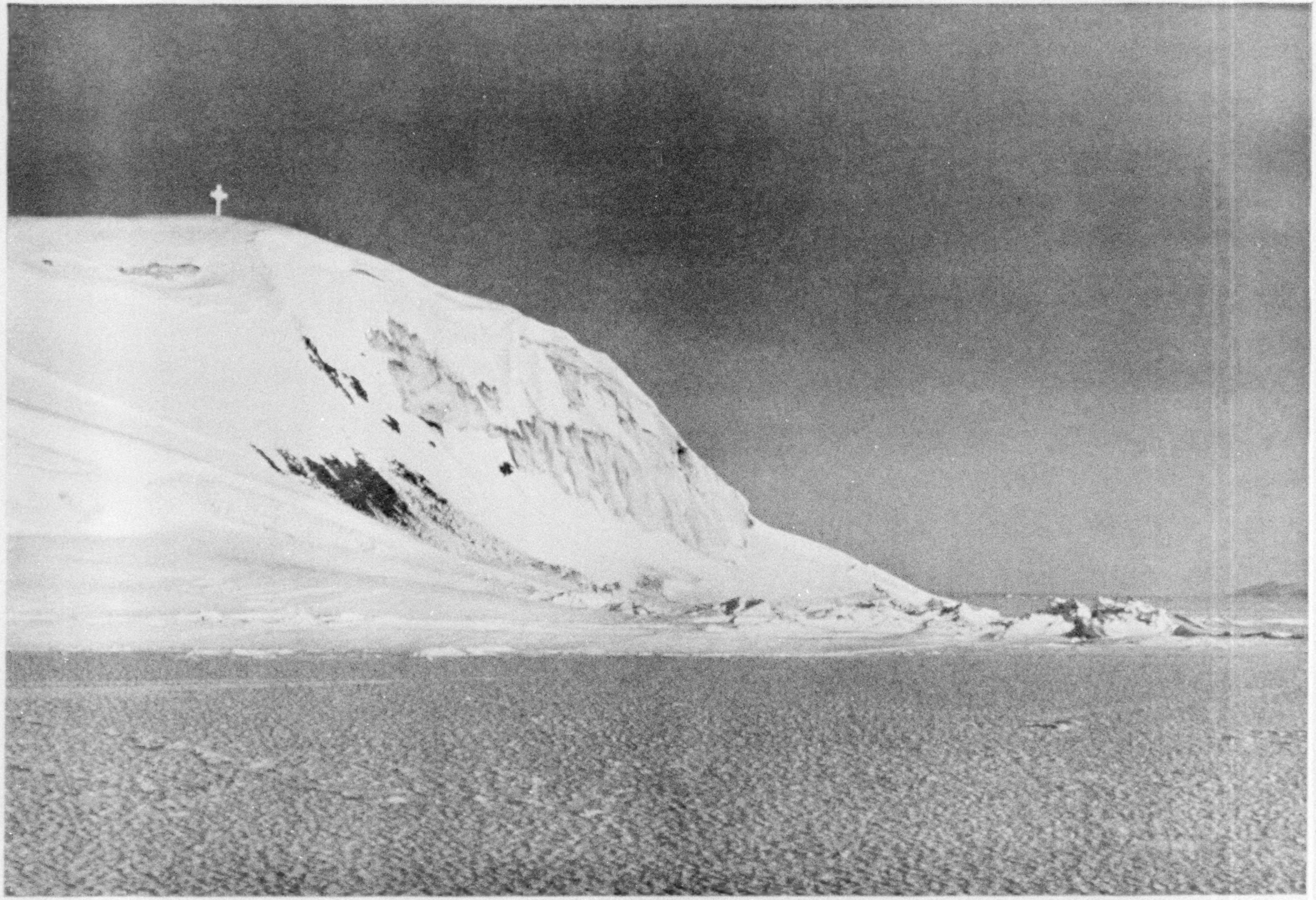
The *Terra Nova*, ship of the Captain Robert F. Scott South Polar party, icebound in the pack. This and the succeeding 15 illustrations are from photographs by Herbert G. Ponting, official photographer of the British Antarctic Expedition (see also an earlier series of illustrations by Mr. Ponting, "Life in the Antarctic," in THE GEOGRAPHIC for December, 1922).



© Herbert G. Ponting

PACK ICE SEEN FROM THE MAINTOP OF THE "TERRA NOVA"

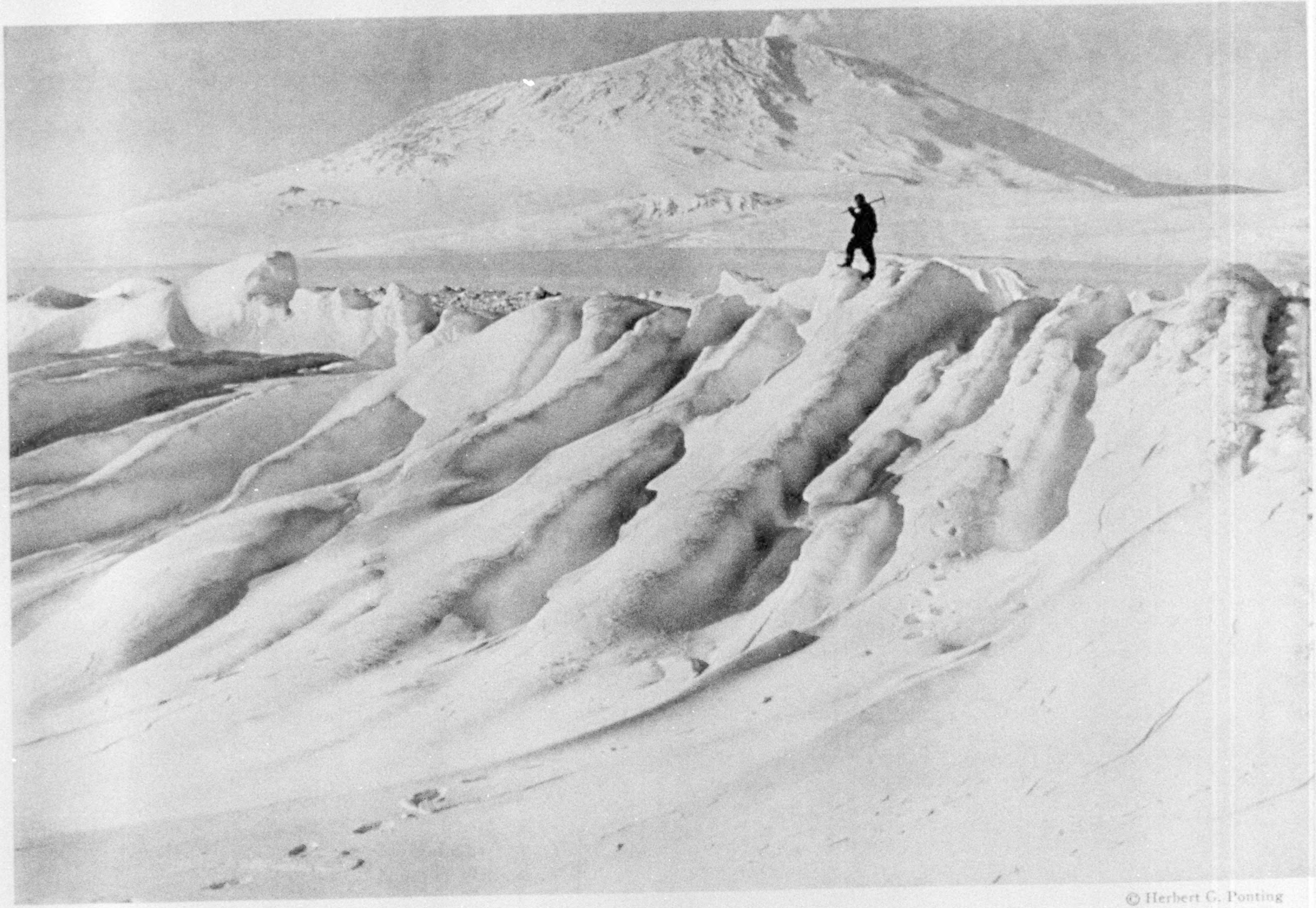
Captain Scott's vessel unfortunately encountered the pack early in its southward voyage and in 20 days had to push through 370 miles of heavy ice. Floes rising 7 or 8 feet out of the water, with pinnacles 25 feet high, were encountered.



© Herbert G. Ponting

LOOKING SOUTH UPON HUT POINT AND VINCE CROSS

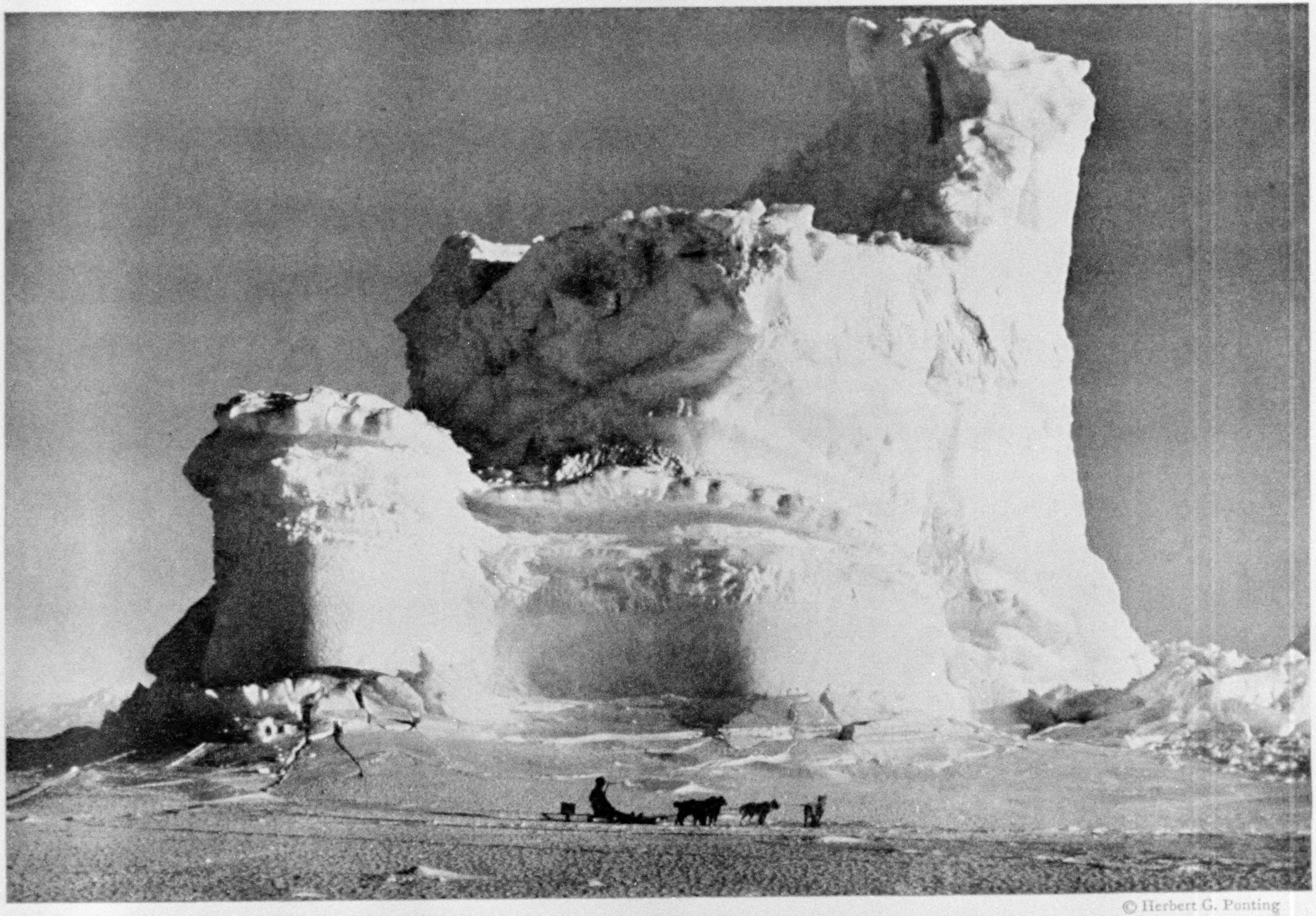
Captain Scott used this point as his base of operations during his expedition of 1901-04 and visited it again in 1911. The white wooden cross was erected to the memory of George T. Vince, one of the men of the *Discovery,* who lost his way in a blizzard, fell over one of the near-by ice cliffs and was killed.



© Herbert G. Ponting

MT. EREBUS SEEN OVER A WATER-WORN ICEBERG

Mt. Erebus (13,350 feet) and Mt. Terror (10,750 feet) are the two loftiest volcanic sentinels of the Antarctic. Erebus is active; Terror, quiescent. The furrows in the overturned iceberg in the foreground have been caused by the action of water.



© Herbert G. Ponting

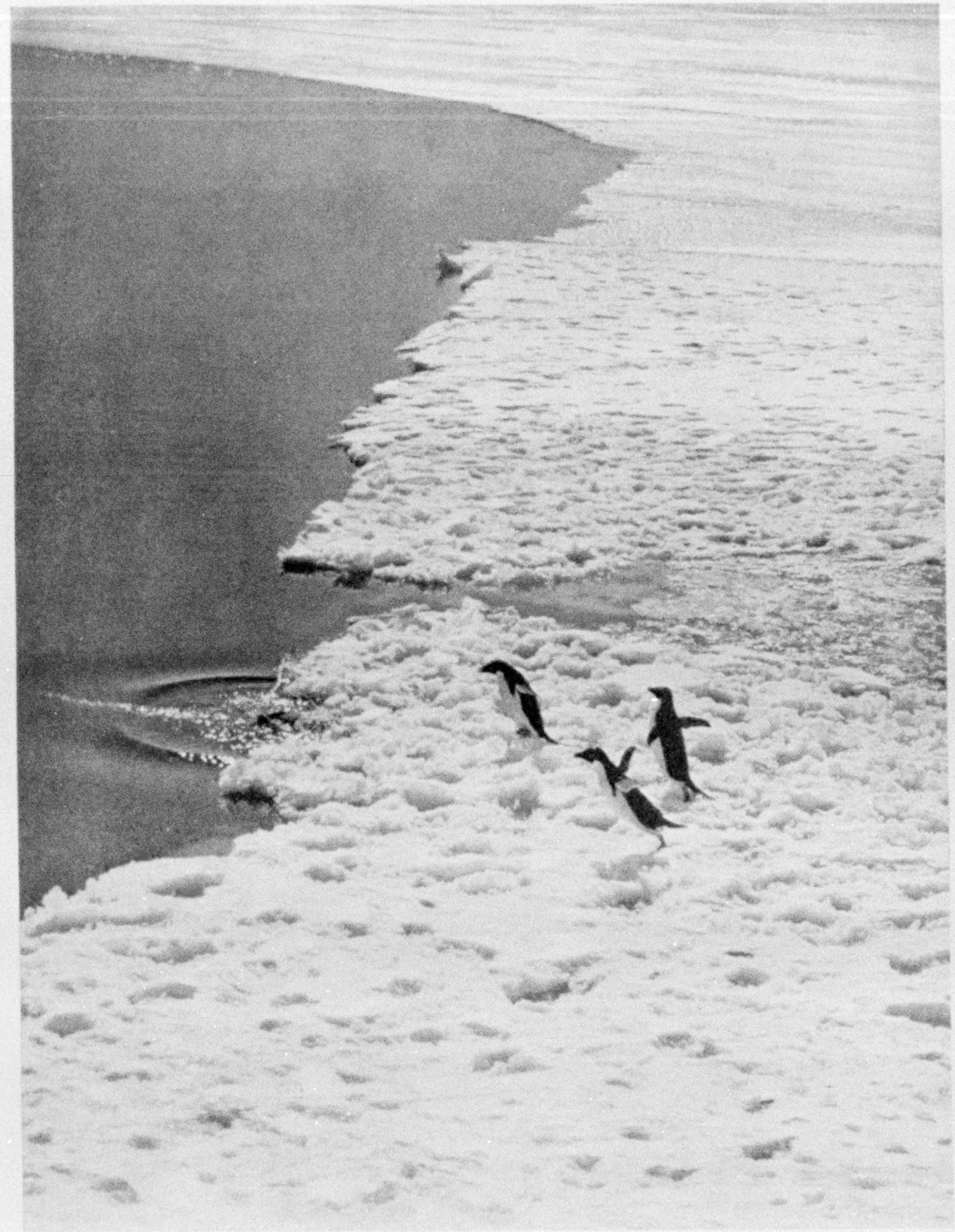
CASTLE ICEBERG FROZEN INTO THE ICE NEAR THE HUT ON CAPE EVANS

This example of Nature's architecture towers to a height of 100 feet.

© Herbert G. Ponting

VIDA, LEADER OF ONE OF THE DOG TEAMS OF THE SCOTT POLAR EXPEDITION

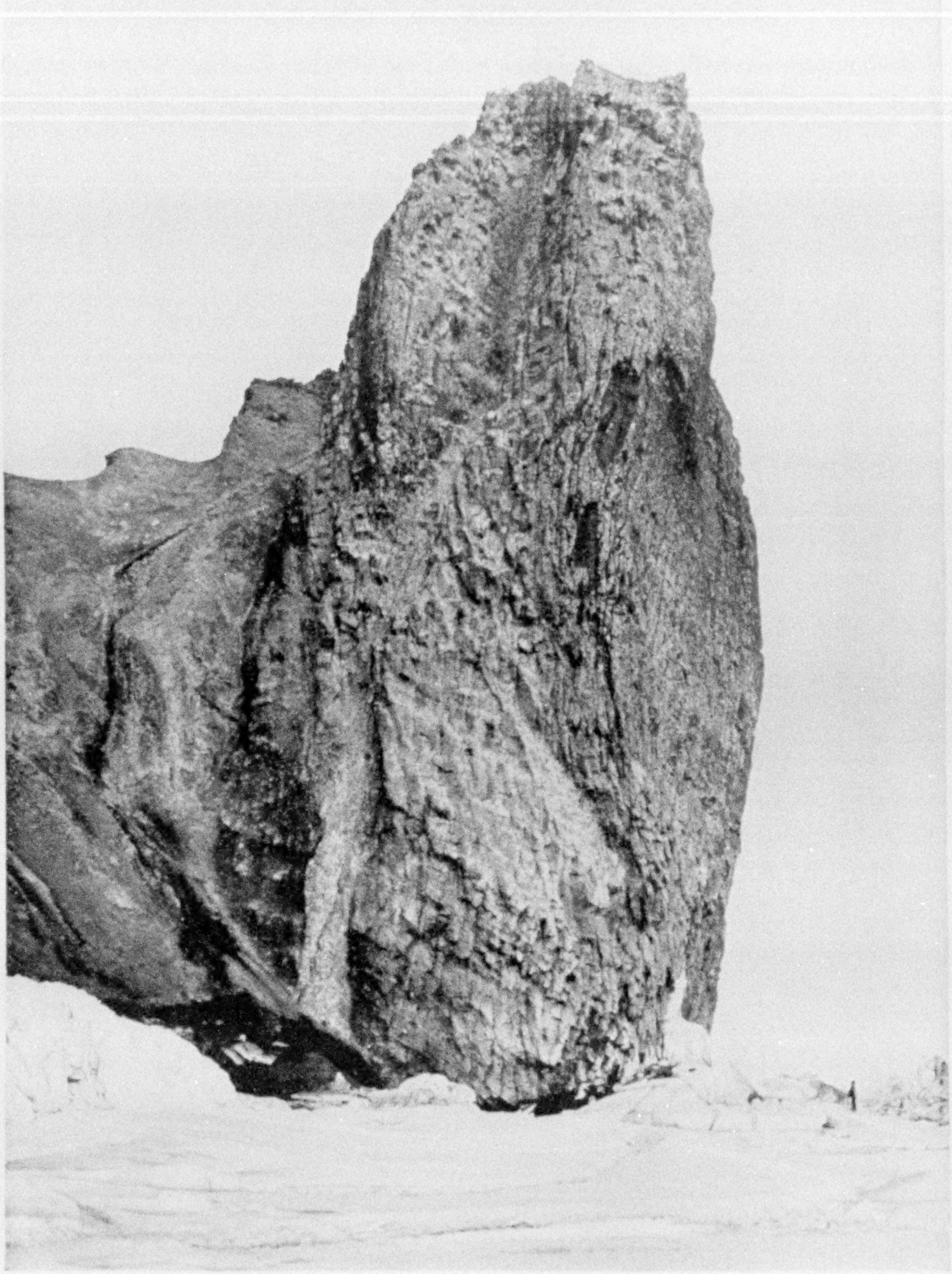
The Scott party carried thirty-three dogs—thirty Eastern Siberian males, two Eskimo, and one New Zealand collie. The largest of these weighed less than eighty pounds, but a team of eleven could pull a load of a thousand pounds fifteen miles in four hours. Vida was a proud creature, seemingly fully conscious of his own strength and fitness for his work.



© Herbert G. Ponting

PENGUINS MAKING FOR THE WATER

These quaint creatures of the Antarctic have a layer of three-quarters of an inch of pure fat under their skins. The oil obtained from their blubber burns much more fiercely than seal oil. Penguin eggs provide an addition to the menu of the explorer; the flesh, after it freezes, is cut into strips and is often eaten on the march.

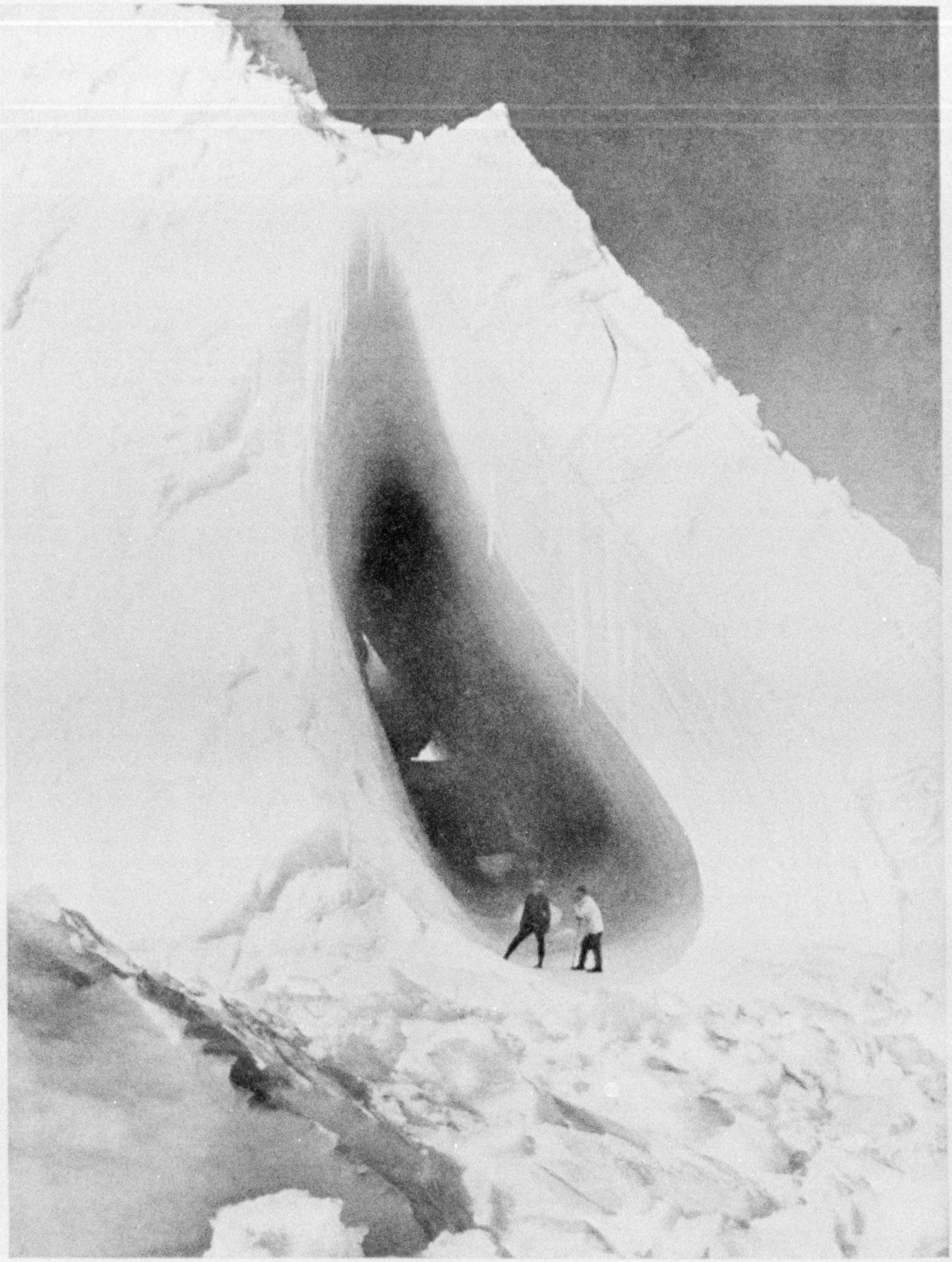


© Herbert G. Ponting

THE VOLCANIC PILLAR AT CAPE BARNE

When the heat of the Antarctic summer sun strikes this remarkable column of lava, rising to a height of 250 feet, it gives off showers of fragments. The man at the right, who provided the scale for the photograph, experienced a veritable bombardment.

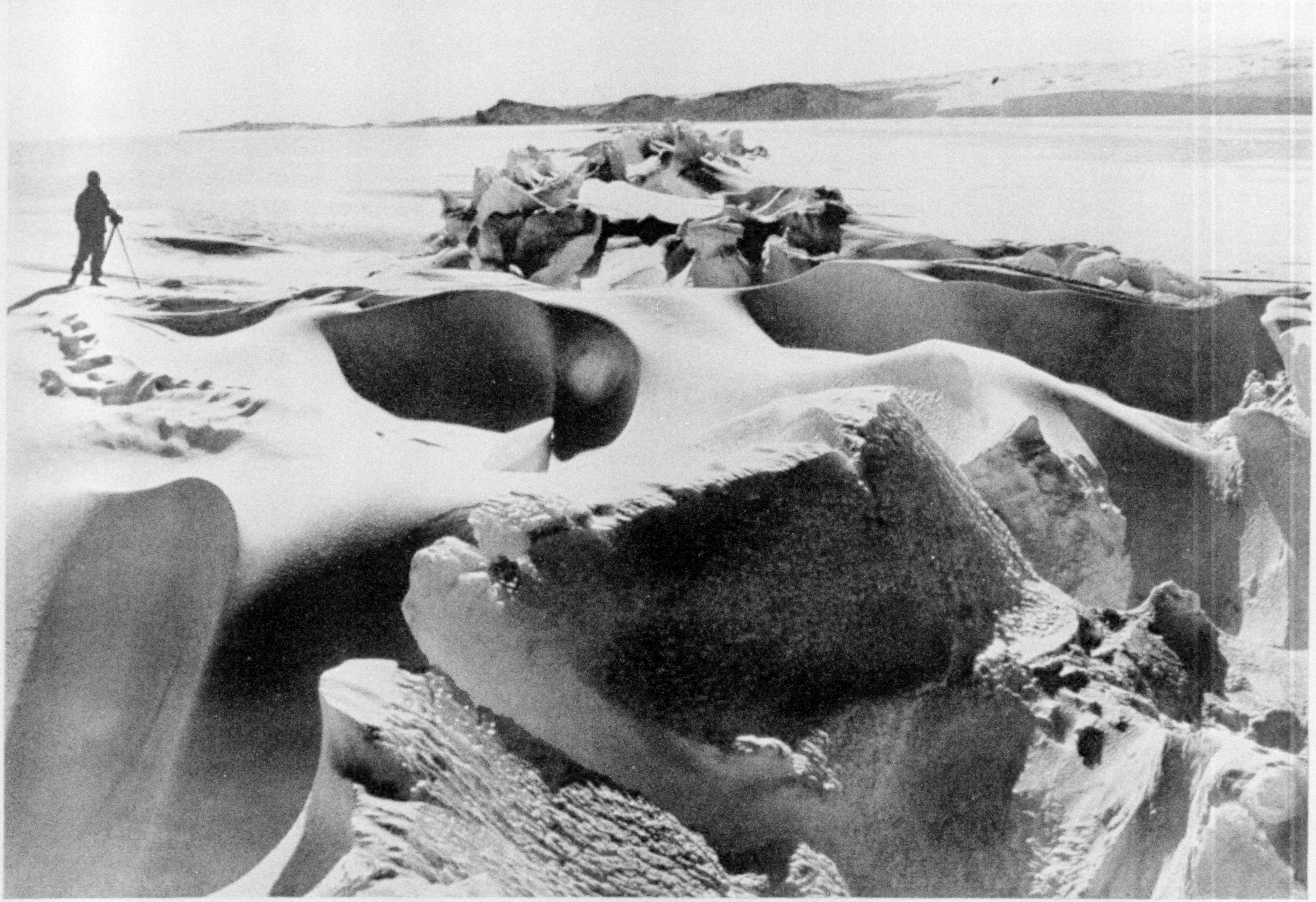
XUM



© Herbert G. Ponting

AT THE THRESHOLD OF AN ICEBERG GROTTO

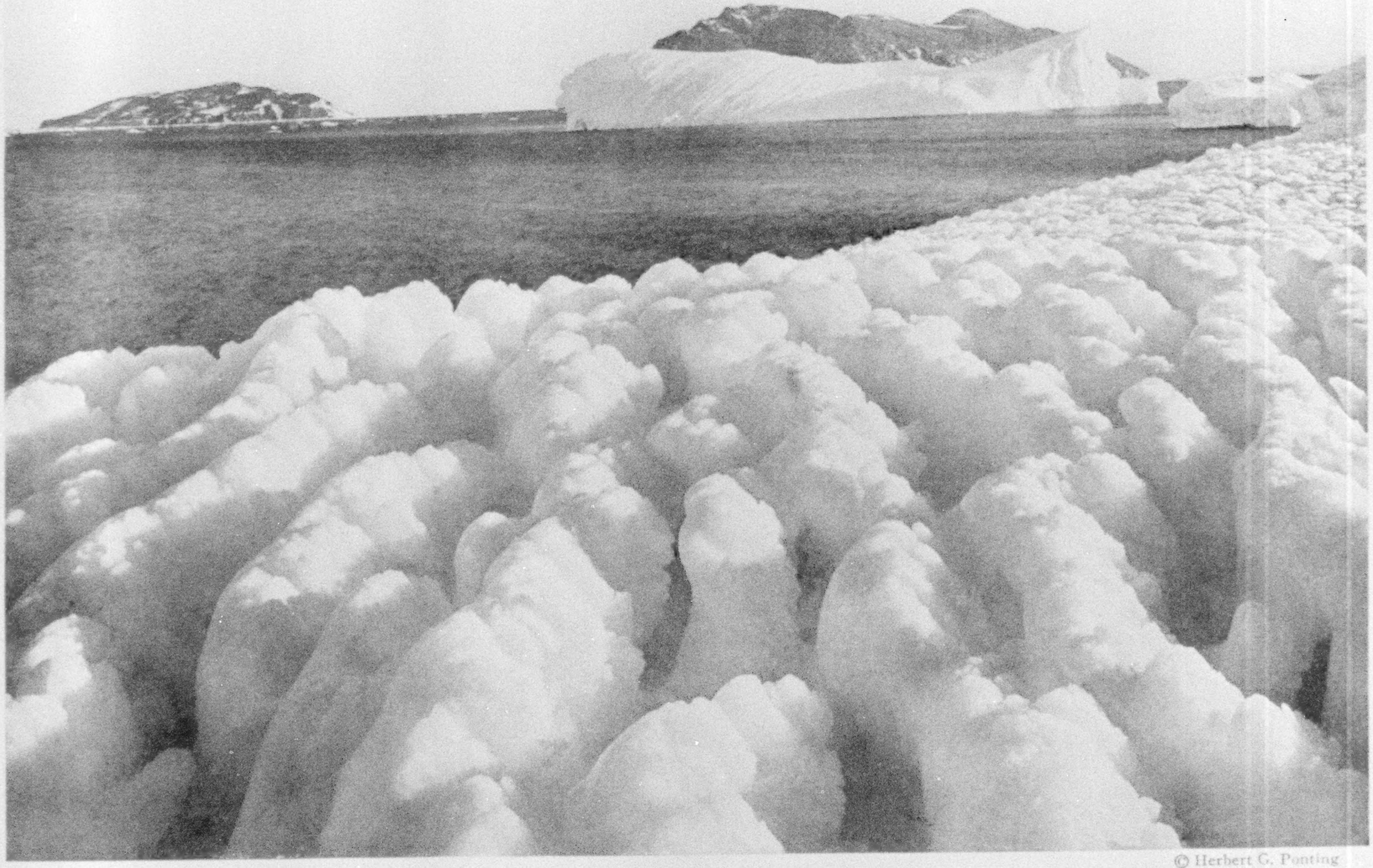
From the outside, the interior of the berg appeared white and colorless, but from within it shone with iridescent blues and greens. An interior view of this unique cavern was shown in the earlier series of Ponting photographs (December, 1922).



© Herbert G. Ponting

A PRESSURE RIDGE, ONE OF THE OBSTACLES OF ANTARCTIC EXPLORATION

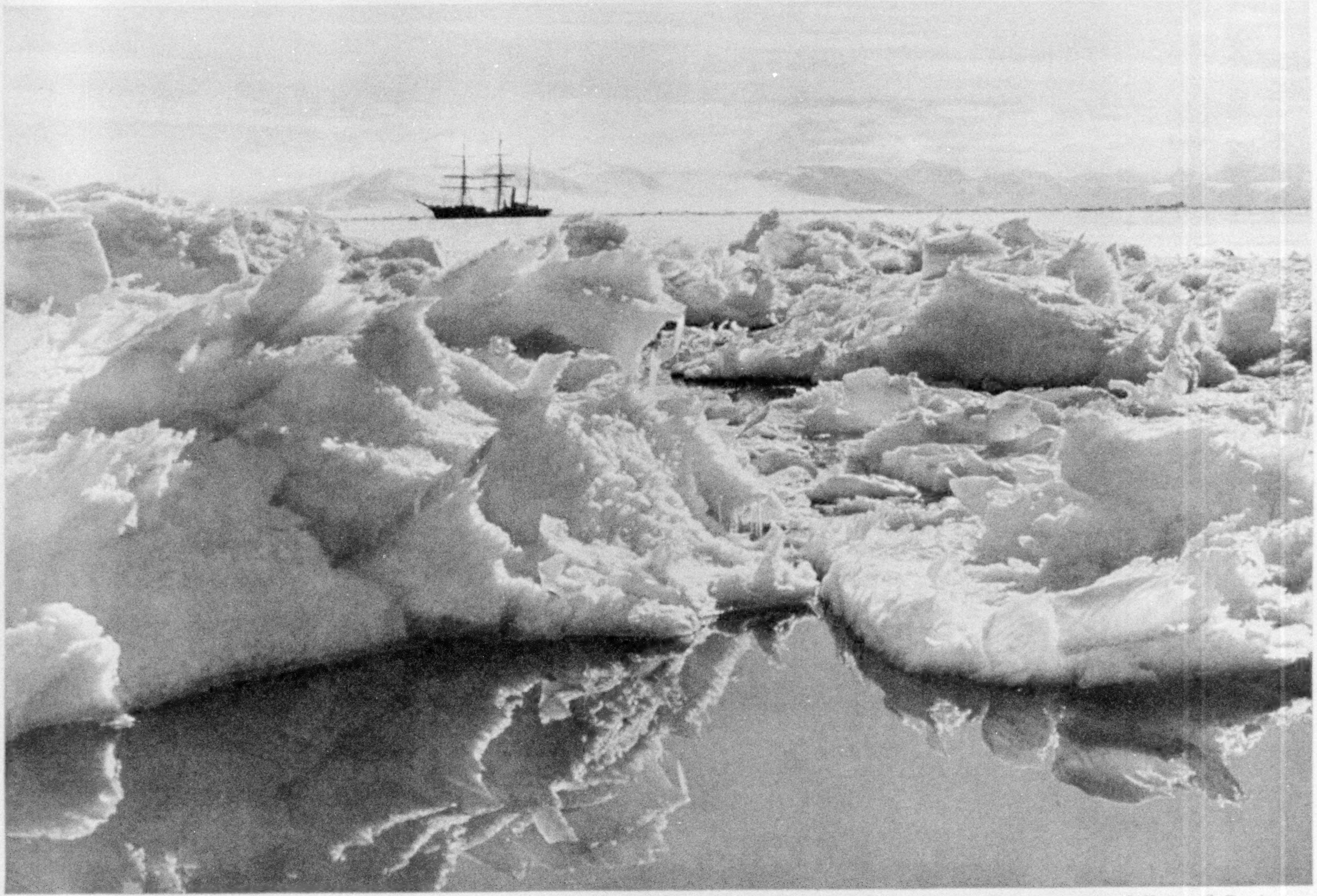
Owing to tremendous pressure, great blocks of ice pile up on both sides of a crack in the frozen sea. The man with the camera is Captain Scott.



© Herbert G. Ponting

FURROWS OF FROZEN SPRAY

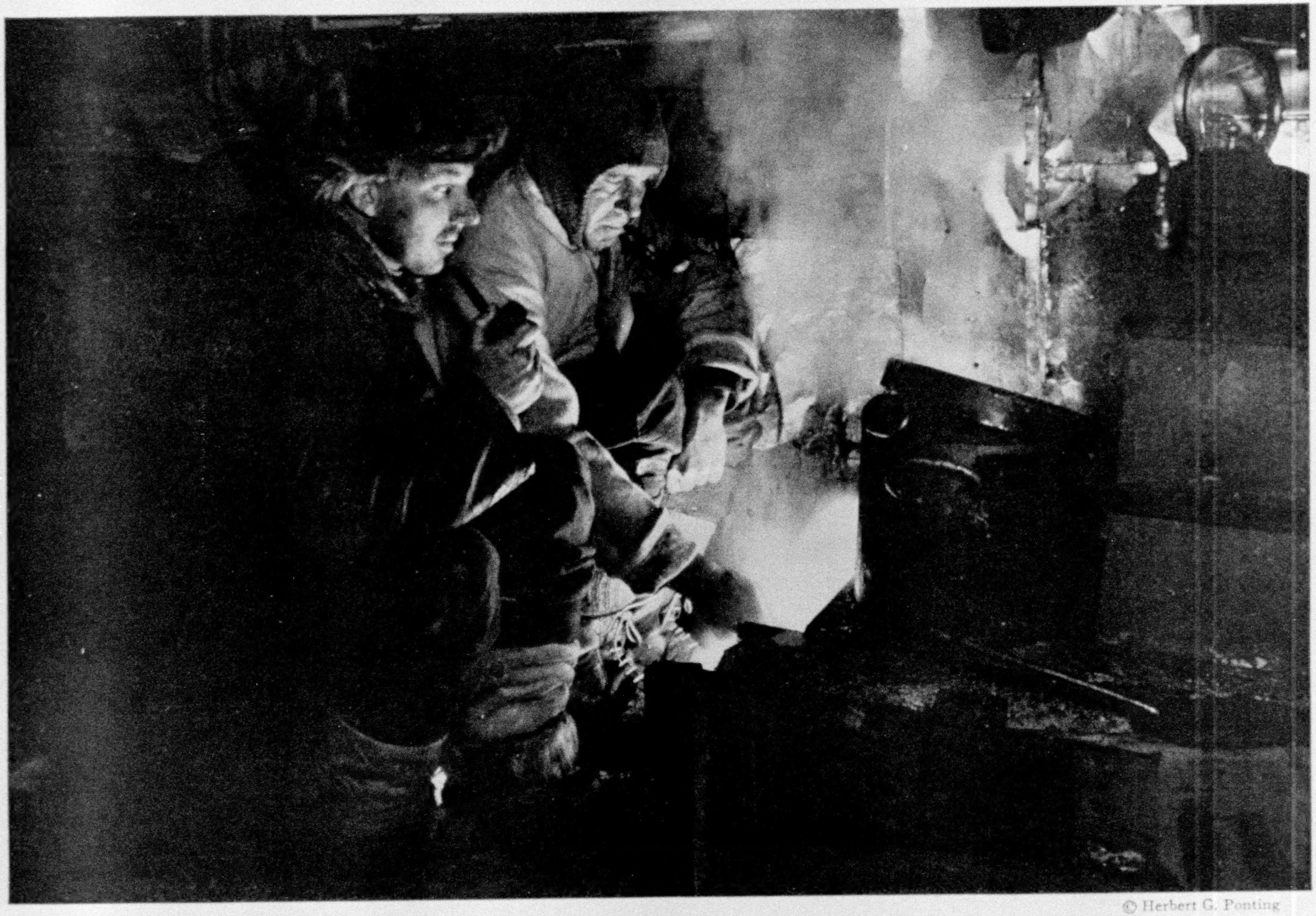
After a severe blizzard from the south, which lasted some days, a great part of the coast line at Cape Evans was thickly covered with furrows and ridges of ice, caused by the spray from the waves which dashed against the ice cliffs, freezing as it fell into this formation. The furrows were three to four feet deep, and the ridges were of the most beautiful crystalline ice. In the distance are Inaccessible and Tent Islands.



© Herbert G. Ponting

THE "TERRA NOVA" IN MCMURDO SOUND

This photographic study, made on a dead-calm day, shows a berg in the last stages of decay, from the action of the sun and sea. In this condition the ice frequently assumes the most beautiful shapes imaginable, which, when reflected in the surface of the sea, make a scene of extraordinary beauty. Beyond the *Terra Nova* are the peaks of the Western Mountains of Victoria Land, seventy miles away.

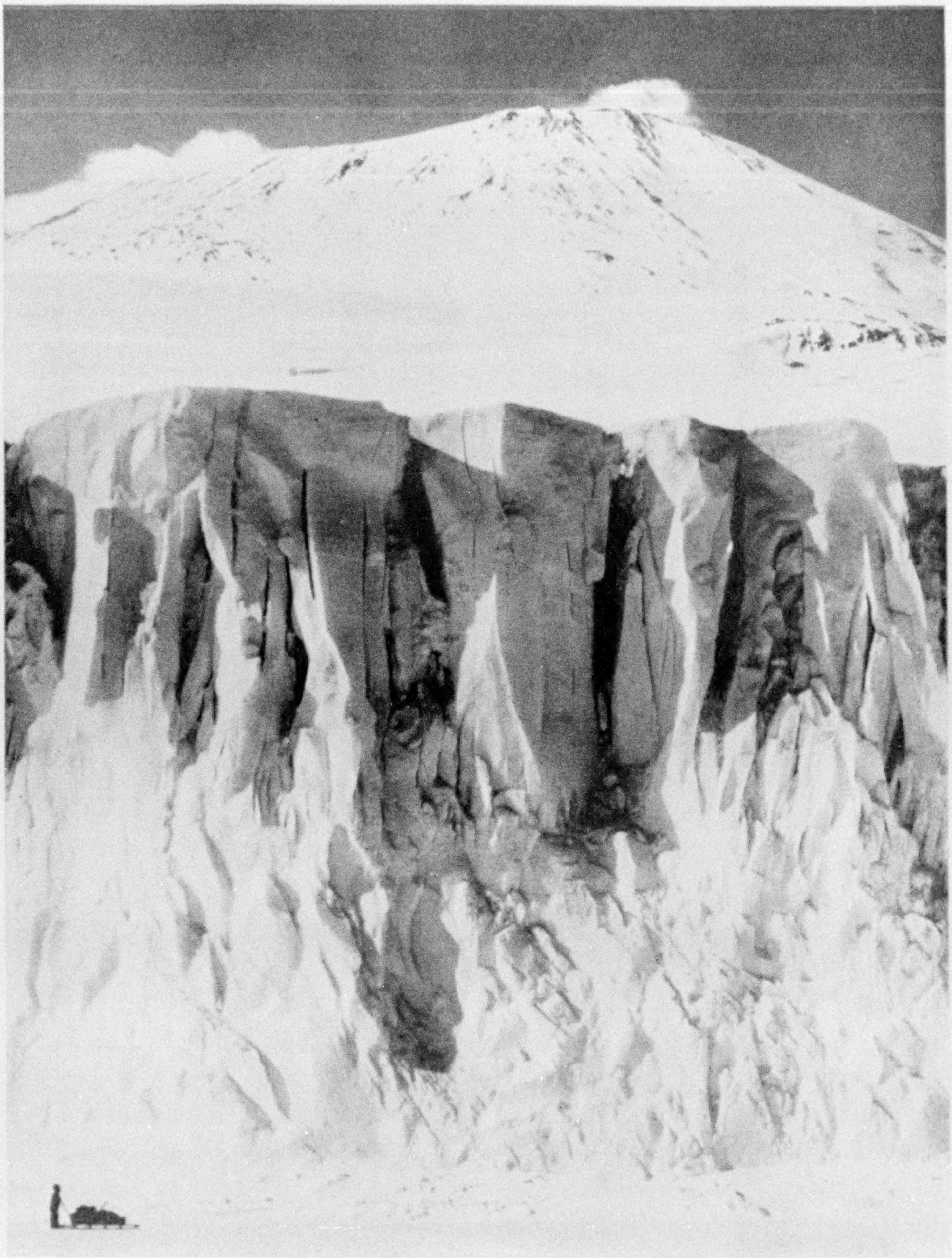


© Herbert G. Ponting

SITTING BEFORE A BLUBBER STOVE IN THE ANTARCTIC

The fat of seals is the fuel used in this type of stove. Here Captain Oates and Cecil Meares, of the Scott Expedition, are cooking bran-mashes for the ponies. It was Oates who, on the homeward march from the Pole, plunged into the blizzard rather than handicap the Scott party further with his frostbitten feet. In the notes found with the bodies of Captain Scott and his party the leader wrote: "We knew that poor Oates was walking to his death, but though we tried to dissuade him, we knew it was the act of a brave man and an English gentleman."

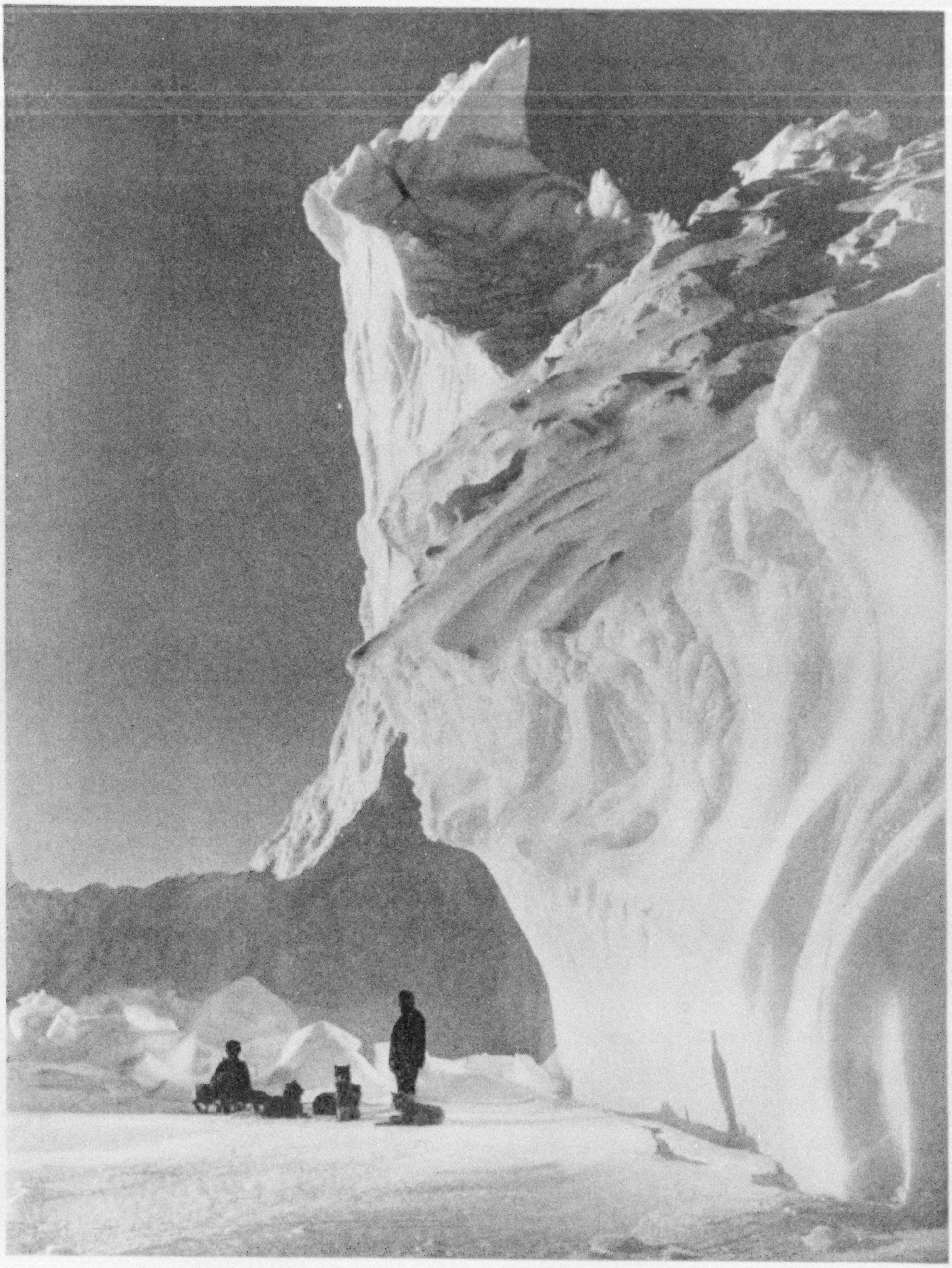
XUM



© Herbert G. Ponting

THE RAMPARTS OF MT. EREBUS

Some idea of the immensity and grandeur of the Antarctic scenery is conveyed in this remarkable picture. In the foreground the cliffs of the Barne Glacier present an impregnable crenelated barrier of ice, ages old and more than 100 feet in height at this point. At the foot of this cliff the figure standing by the sledge appears of Lilliputian size. Above the edge of the glacier, fifteen miles distant, but in the clear polar air apparently much nearer, appears Erebus, the great White Queen of the Antarctic, a mass of ice-covered lava (see also illustration, page 258).

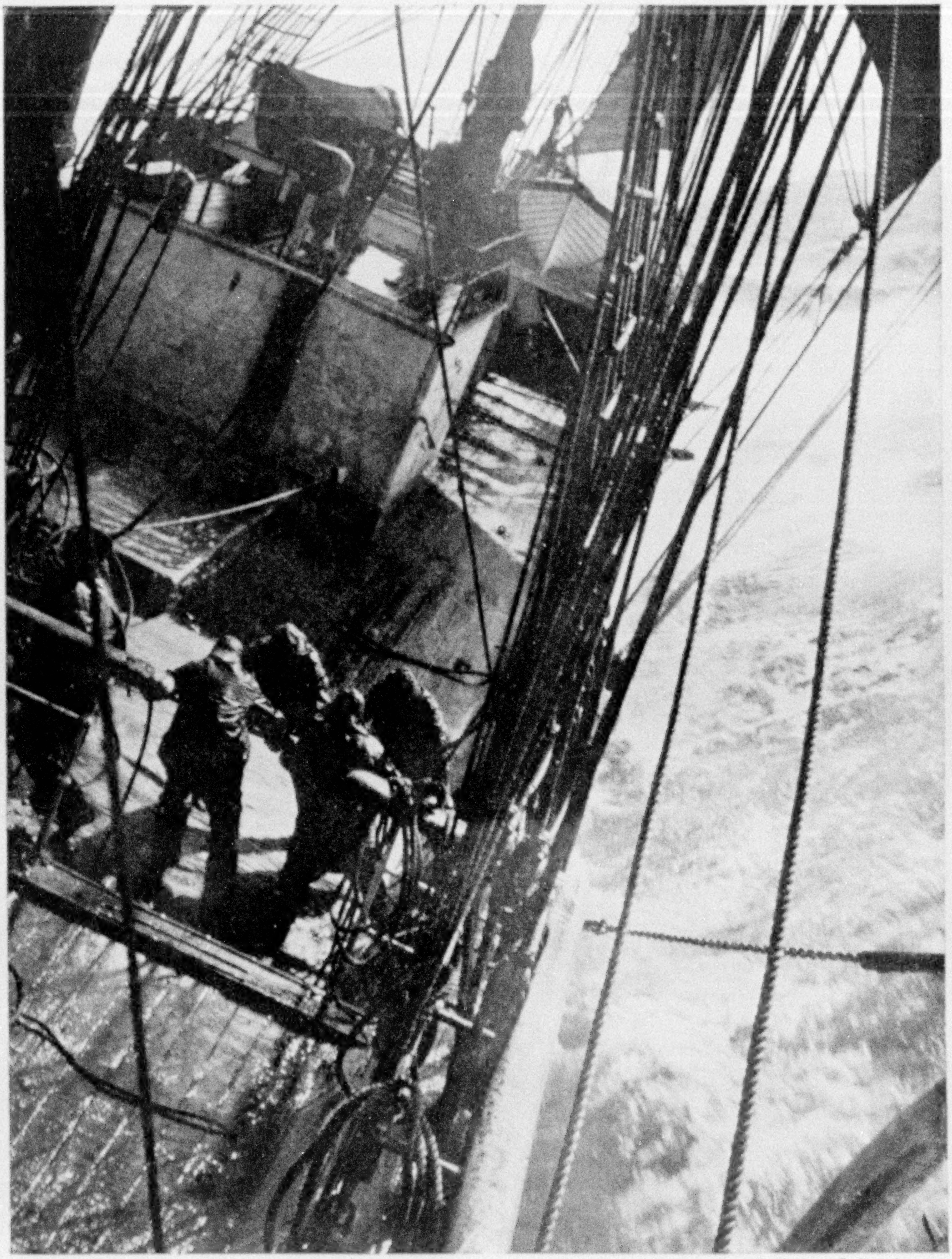


© Herbert G. Ponting

A DOG TEAM RESTING BY AN ICEBERG

The birthplace of the thousands of Antarctic icebergs, which break away each year in masses sometimes many miles in length, is the Great Ice Barrier, a vast ice sheet having an aggregate area as large as the combined areas of all the New England States, New York, and Pennsylvania. It has been estimated that one of the icebergs encountered by the last Scott expedition was large enough to have carried on its back the entire city of London and all its suburbs.

XUM



© Herbert G. Ponting

THE "TERRA NOVA" IN A GALE

Four days before his death, after he had reached the South Pole and returned within 155 miles of his home base, Captain Scott wrote: "I do not regret this journey, which has shown that Englishmen can endure hardships, help one another, and meet death with as great fortitude as ever in the past. . . . We have been willing to give our lives for this enterprise, which is in honor of our country."

that entry of Tanganyika on the blank of my old atlas.

It must not be supposed that I gave up my interest in the polar regions. My heart and my warm participation swung from the frigid to the torrid zone, fascinated by the problems of each, no doubt, but more yet by the men who, like masters of a great art, worked each according to his temperament to complete the picture of the earth. Almost each day of my schoolboy life had its hour given up to their company. And to this day I think that it was a very good company.

VISIONS OF THREE GREAT AFRICAN EXPLORERS

Not the least interesting part in the study of geographical discovery lies in the insight it gives one into the characters of that special kind of men who devoted the best part of their lives to the exploration of land and sea.

In the world of mentality and imagination which I was entering, it was they, and not the characters of famous fiction, who were my first friends. Of some of them I had soon formed for myself an image indissolubly connected with certain parts of the world. For instance, Western Sudan, of which I could draw the rivers and principal features from memory even now, means for me an episode in Mungo Park's life.

It means for me the vision of a young, emaciated, fair-haired man, clad simply in a tattered shirt and worn-out breeches, gasping painfully for breath and lying on the ground in the shade of an enormous African tree (species unknown), while from a neighboring village of grass huts a charitable black-skinned woman is approaching him with a calabash full of pure cold water—a simple draft which, according to himself, seems to have effected a miraculous cure.

The Central Sudan, on the other hand, is represented to me by a very different picture: that of a self-confident and keen-eyed person, in a long cloak and wearing a turban on his head, riding slowly toward a gate in the mud walls of an African city, from which an excited population is streaming out to behold the wonder—Dr. Barth, the protégé of Lord Palmerston and subsidized by the British Foreign Office, approaching Kano, which no European eye had seen till then, but where forty years later my friend Sir Hugh Clifford, the Governor of Nigeria, traveled in state in a day to open a college!

I must confess that I read that bit of news and inspected the many pictures in the illustrated papers without any particular elation. Education is a great thing, but Dr. Barth gets in the way.

Neither will the monuments left by all sorts of empire-builders suppress for me the memory of David Livingstone. The words Central Africa bring before my eyes an old man with a rugged, kind face and a clipped gray mustache, pacing wearily, at the head of a few black followers, along the reed-fringed lakes toward the dark native hut on the Congo headwaters in which he died, clinging in his very last hour to his heart's unappeased desire for the sources of the Nile.

That passion had changed him in his last days from a great explorer into a restless wanderer, refusing to go home any more. From his exalted place among the blessed of militant geography and his memory enshrined in Westminster Abbey, he can well afford to smile without bitterness at the fatal delusion of his exploring days, a notable European figure and the most venerated, perhaps, of all objects of my early geographical enthusiasm.

A SCHOOLBOY PROPHECY REALIZED

Once only did that enthusiasm expose me to the derision of my schoolboy chums. One day, putting my finger on a spot in the very middle of the then white heart of Africa, I declared that some day I would go there.

My chums' chaffing was perfectly justifiable. I myself was ashamed of having been betrayed into mere vaporing. Nothing was further from my wildest hopes. Yet it is a fact that, about eighteen years afterwards, a wretched little stern-wheel steamboat I commanded lay moored to the bank of an African river.

Everything was dark under the stars. Every other white man on board was asleep. I was glad to be alone on deck, smoking the pipe of peace after an anxious day. The subdued thundering mutter of the Stanley Falls hung in the heavy night air of the last navigable reach of the Upper Congo, while no more than ten miles away, in Reshid's camp, just above the falls, the yet unbroken power of the Congo Arabs slumbered uneasily. Their day was over.

Away in the middle of the stream, on a little island nestling all dark in the foam of the broken water, a solitary little light glimmered feebly, and I said to myself with awe, "This is the very spot of my boyish boast."

A great melancholy descended on me. Yes; this was the very spot. But there was no shadowy friend to stand by my side in the night of the enormous wilderness, no great haunting memory, but only the unholy recollection of a prosaic newspaper stunt and the distasteful knowledge of the vilest scramble for loot that ever disfigured the history of human conscience and geographical exploration. What an end to the idealized realities of a boy's daydreams!

I wondered what I was doing there, for indeed it was only an unforeseen episode, hard to believe in now, in my seaman's life. Still the fact remains that I have smoked a pipe of peace at midnight in the very heart of the African Continent, and felt very lonely there.

NO LONELINESS AT SEA

But never so at sea. There I never felt lonely, because there I never lacked company—the company of great navigators, the first grown-up friends of my early boyhood. The unchangeable sea preserves for one the sense of its past, the memory of things accomplished by wisdom and daring among its restless waves.

It was those things that commanded my profoundest loyalty, and perhaps it is by the professional favor of the great navigators, ever present to my memory, that, neither explorer nor scientific navigator, I have been permitted to sail through the very heart of the old Pacific mystery; a region which even in my time remained very imperfectly charted and still remote from the knowledge of men.

It was in 1888, when in command of a ship loading in Sydney a mixed cargo for Mauritius, that one day, all of a sudden, all the deep-lying historic sense of the exploring adventures in the Pacific surged up to the surface of my being.

Almost without reflection, I sat down and wrote a letter to my owners, suggesting that, instead of the usual southern route, I should take the ship to Mauritius by way of Torres Strait. I ought to have received a severe rap on the knuckles, if only for wasting their time in submitting such an unheard-of proposition.

I must say I awaited the reply with some trepidation. It came in due course, but instead of beginning with the chiding words, "We fail to understand, etc., etc.," it simply called my attention in the first paragraph to the fact that "there would be an additional insurance premium to pay for that route," and so on and so on. And it ended like this: "Upon the whole, however, we have no objection to your taking the ship through Torres Strait if you are certain that the season is not too far advanced to endanger the success of your passage by the calms which, as you know, prevail at times in the Arafura Sea."

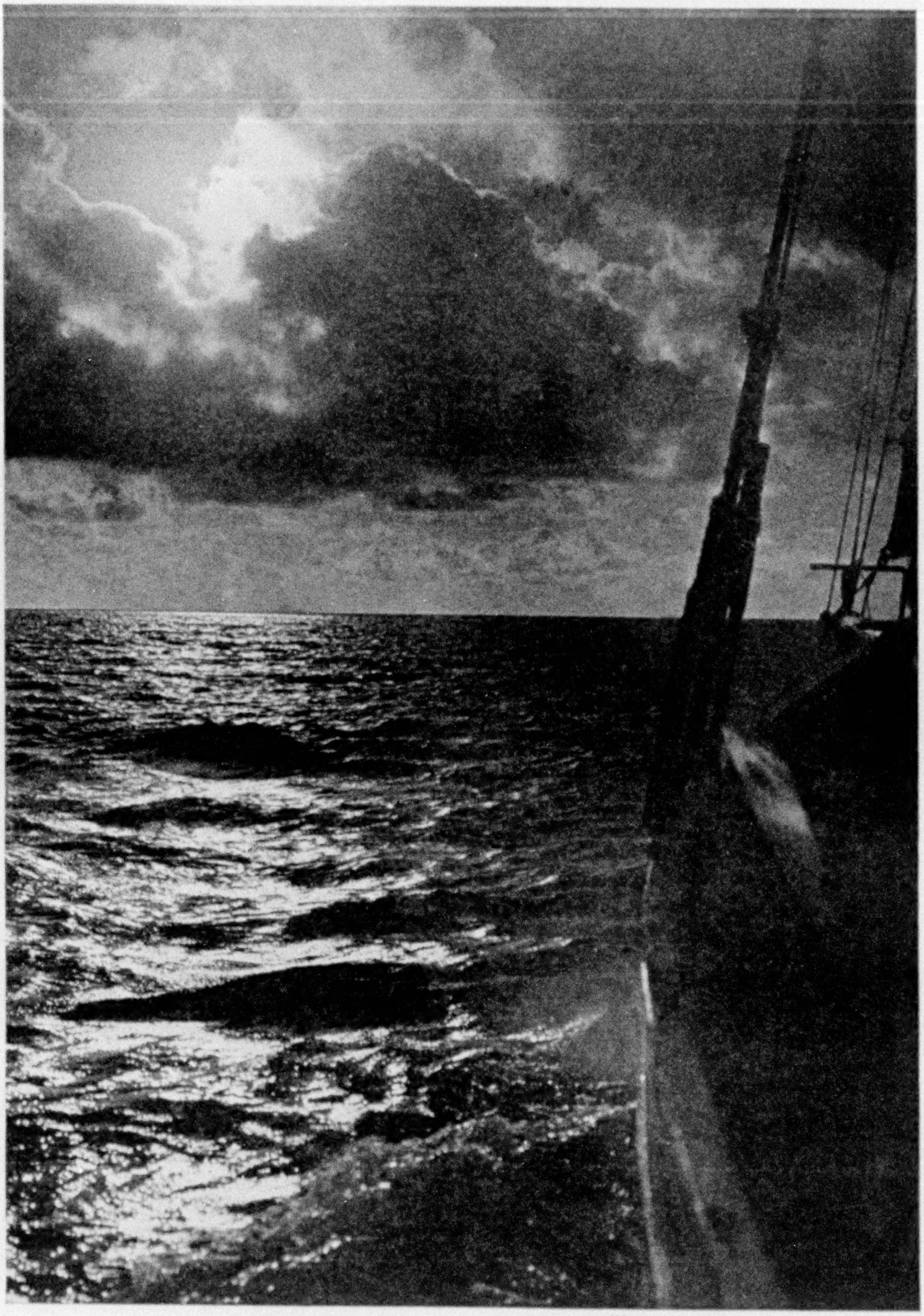
I read, and in my heart I felt compunctious. The season was somewhat advanced. I had not been scrupulously honest in my argumentation. Perhaps it was because I never expected it to be effective. And here it was all left to my responsibility. My letter must have struck a lucky day in Messrs. H. Simpson & Sons' offices—a romantic day.

I won't pretend that I regret my lapse from strict honesty, for what would the memory of my sea life have been for me if it had not included a passage through Torres Strait, in its fullest extent, from the mouth of the great Fly River, right on along the track of the early navigators.

THE VOYAGE THROUGH THE TORRES STRAIT

The season being advanced, I insisted on leaving Sydney during a heavy southeast gale. Both the pilot and the tugmaster were scandalized by my obstinacy, and they hastened to leave me to my own devices while still inside Sydney Heads.

The fierce southeaster caught me up on its wings, and no later than the ninth day I was outside the entrance of Torres Strait, named after the undaunted and reticent Spaniard who in the seventeenth century first sailed that way without knowing where he was; without suspecting he had New Guinea on one side of him and the whole solid Australian Continent on the other (he thought he was passing through an archipelago), the



Photograph by Captain Frank Hurley

TORRES STRAIT BY MOONLIGHT

Between the island of New Guinea and the northeastern peninsula of Australia runs this reef-strewn passage, some eighty miles in width, a water lane of terror to the mariner (see text, page 272).

strait whose existence for a century and a half had been doubted, argued, squabbled about by geographers, and even denied by the disreputable but skillful navigator Abel Tasman (who thought it was a large bay), and whose true contours were first laid down on the map by James Cook, the navigator without fear and without reproach, the greatest in achievement and character of the later seamen fathers of militant geography.

If the dead haunt the scenes of their earthly exploits, then I must have been attended benevolently by those three shades—the inflexible Spaniard, of such lofty animus that in his report he disdains to say a single word about the appalling hardships and dangers of his passage; the pig-headed Hollander who, having made up his mind that there was no passage there, missed the truth by only fifty miles or so; and the great Englishman, a son of the soil, a great commander and a great professional seaman, who solved that question, among many others, and left no unsolved problems of the Pacific behind him. Great shades, all friends of my youth!

DEAD SHIPS IN TORRES STRAIT

It was not without a certain emotion that, commanding very likely the first and certainly the last merchant ship that carried a cargo that way, from Sydney to Mauritius, I put her head at daybreak for Bligh Entrance and packed on her every bit of canvas she could carry.

Windswept, sunlit, empty waters were all around me, half veiled by a brilliant haze. The first thing that caught my eye upon the play of green white-capped waves was a black speck marking conveniently the end of a low sand bank. It looked like the wreck of some small vessel.

I altered the course slightly in order to pass close, with the hope of being able to read the letters on her stern. They were already faded. Her name was *Honolulu*. The name of the port I could not make out. The story of her life is known by now to God alone, and the winds must have drifted long ago around her remains a quiet grave of the very sand on which she had died.

Thirty-six hours afterwards, of which about nine were spent at anchor, approaching the other end of the strait, I sighted a gaunt, gray wreck of a big American ship lying high and dry on the southernmost of the Warrior Reefs. She had been there for years. I had heard of her. She was legendary. She loomed up a sinister and enormous *memento mori*, raised by the refraction of this serene afternoon above the far-away line of the horizon drawn under the sinking sun.

And thus I passed out of Torres Strait before the dusk settled on its waters.

Just as a clear sun sank ahead of my ship, I took a bearing of a little island for a fresh departure, an insignificant crumb of dark earth, lonely, like an advanced sentinel of that mass of broken land and water, to watch the approaches from the side of the Arafura Sea. But to me it was a hallowed spot, for I knew that the *Endeavour* had been hove to off it in the year 1762 for her captain, whose name was James Cook, to go ashore for half an hour. What he could possibly want to do I cannot imagine. Perhaps only to be alone with his thoughts for a moment.

The dangers and the triumphs of exploration and discovery were over for that voyage. All that remained to do was to go home; and perhaps his great and equable soul, tempered in the incessant perils of a long exploration, wanted to commune with itself at the end of its task.

It may be that on this dry crumb of the earth's crust which I was setting by compass he had tasted a moment of perfect peace. I could depict to myself the great seaman navigator, a lonely figure, in a three-cornered hat and square-skirted laced coat, pacing to and fro slowly on the rocky shore, while in the ship's boat, lying off on her oars, the coxswain kept his eyes open for the slightest sign of the captain's hand.

Thus the sea has been for me a hallowed ground, thanks to those books of travel and discovery which had peopled it for me with unforgettable shades of the masters in the calling which in a humble way was to be mine, too—men great in their endeavor and in hard-won successes of militant geography; men who went forth, each according to his lights and with varied motives, laudable or sinful, but each bearing in his breast a spark of the sacred fire.

XUM

BEYOND THE CLAY HILLS

An Account of the National Geographic Society's Reconnaissance of a Previously Unexplored Section in Utah

By Neil M. Judd

Leader of the National Geographic Society's Pueblo Bonito Expeditions

Among my fellow-members of the National Geographic Society there are very few, I fancy, who have even thought of the possibility that these United States of the 20th century may have escaped thorough exploration; yet the fact remains that areas still exist—relatively small areas when compared with their parent States—about which little or nothing is definitely known. They remained in hiding when "the last frontier" was pushed westward into the Pacific.

Such neglected areas require no second Lewis and Clark Expedition. Their conquest would seem as child's play to those mountain men who trailed through the Rockies over one hundred years ago, or to those pioneers who braved the unknown in the late forties, seeking new homes on the Oregon and California coasts. Kit Carson lived to watch the Old West fade into the dust of endless immigrant trains; Jim Bridger retired to his little farm near Taos, New Mexico, about 1832 because the Great Interior Basin had become too thickly populated and trapping was no longer worth the effort.

The latest United States map* embodies a wealth of diverse information garnered from sundry sources. It pictures winding blue rivers and the red threads of a vast interlocking network of railroads and interurban lines; it locates cities, towns, and mere filling stations; it traces transcontinental highways and many local roads that are utterly impassable following the midsummer rains, and it also discloses to the searching eye certain isolated districts that exhibit none of those symbols which denote the passing of man on his conquests.

For the most part, these latter districts were left bare simply because the map-maker could obtain no reliable information with which to relieve their bareness; they are, with few exceptions, areas which have never supported a surveyor's transit—areas which are still practically unknown and unexplored.

AN UNKNOWN LAND IN THE HEART OF OUR SOUTHWEST

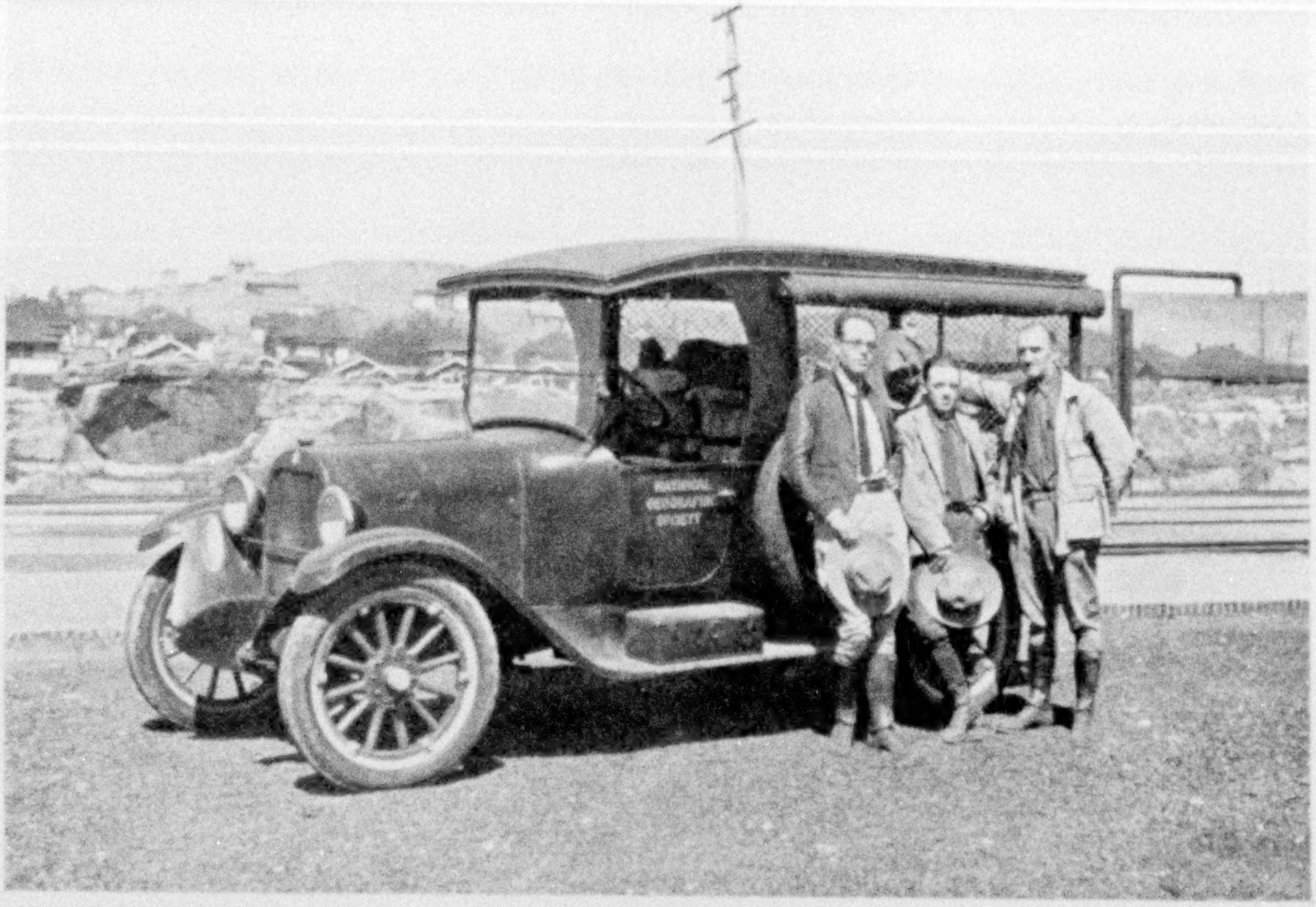
One such area borders the Rio Colorado in Utah. East and west from this savage red river unmapped mesas stretch away mile after barren mile to green mountains, overtopping an endless distance of pink and white and brown sandstone. Through these thousand-foot layers of solid rock tireless streams have carved for eons, each widening and deepening its pathway to the sea. And man in his wanderings has occasionally followed these same paths, avoiding the blistered table-lands between.

Securely guarded by the deep gorges of the Rio San Juan and the Colorado lies the least-known section, perhaps, of this gigantic rock-floored region. It remains a veritable *terra incognita*. A few adventurers have brushed its more accessible corners, for we find their rusted camp kettles and hear indirect tales of their comings or goings, but they left no permanent record of their individual journeys to aid the topographer or the historian.

Because of the mystery wrapped about it: because, seemingly, it had been so purposely avoided; because all trails led around and none through it, this particular region, nestling in the elbow of the great Colorado, held a peculiar fascination for me. Back in 1907, while searching

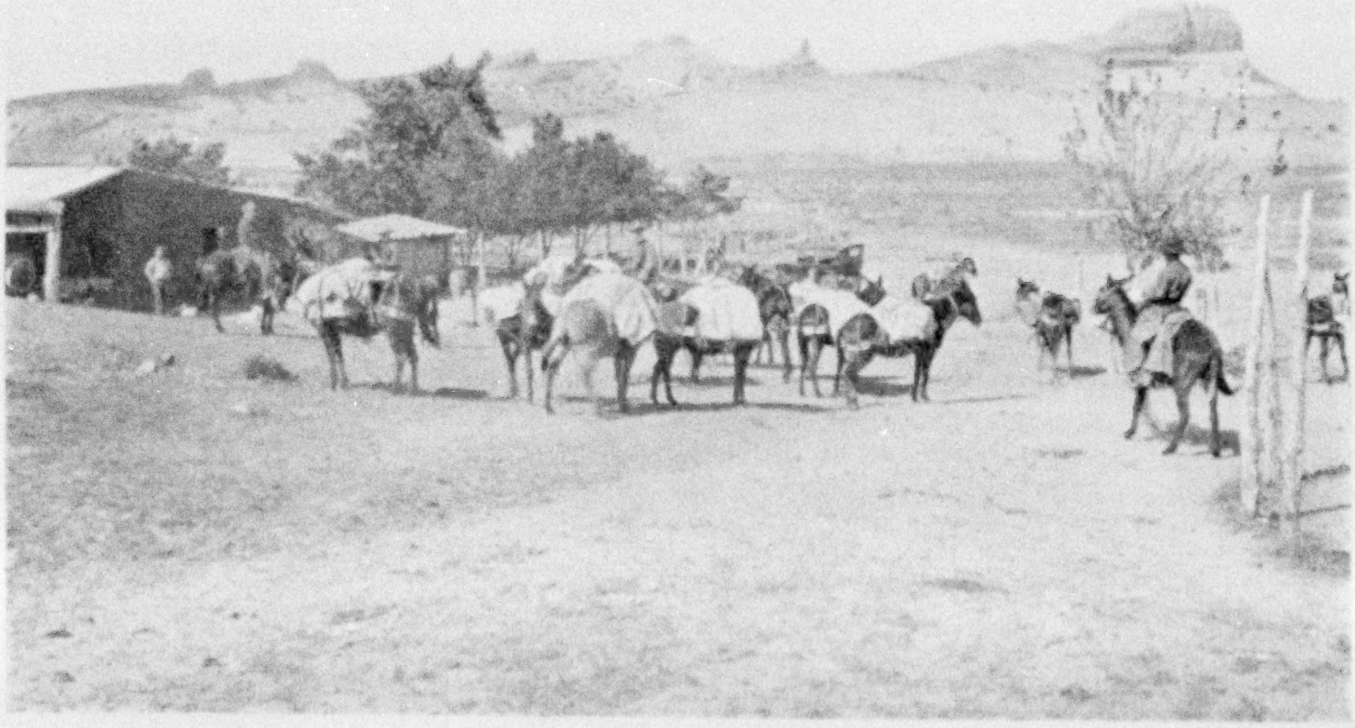
---

* "United States of America," in five colors, published by the National Geographic Society as a map supplement with the National Geographic Magazine for April, 1923. Size, 38 x 28 inches. Additional copies, paper, $1.00; linen, $1.50.



NATIONAL GEOGRAPHIC SOCIETY REPRESENTATIVES READY FOR THE START FOR KAYENTA

George B. Martin, Edwin L. Wisherd, and the writer, as they left Gallup, New Mexico, for Kayenta, outfitting point for the San Juan Expedition.



Photograph by Edwin L. Wisherd

THE EXPEDITION'S PACK-TRAIN LEAVING KAYENTA

Photograph by Neil M. Judd

DESERT TRAILS ARE OFTEN LONG AND WEARY, WITH THE HORIZON SEEMINGLY FIXED IN ITS DISTANCE

the shadows of White Canyon for footprints of the ancient cliff-dwellers, I had gazed southward across its silent, shimmering expanse. Again, in 1909, accompanying Dean Byron Cummings to the discovery of the incomparable Rainbow Natural Bridge* (see pages 298 and 299), this same untamed district, when viewed from the gray slopes of Navajo Mountain, had lost none of its inherent mystery and charm.

AGREES TO CARRY THE SOCIETY'S BANNER ALONG UNTRODDEN TRAILS

Still a decade later, from ridges that neighbor Kaiparowits Plateau and the Circle Cliffs, far to the west, that siren something which tempts desert pilgrims from their appointed way beckoned me toward the grim silence and the elusiveness of this unknown canyon country. The desert possesses an impelling force—an indescribable force, infinitely magnified with greater distance and isolation from the usual haunts of men.

So it was with a strange mingling of secret satisfaction and dubiousness that I accepted the National Geographic Society's recent invitation to carry its banner yet farther along untrodden trails.

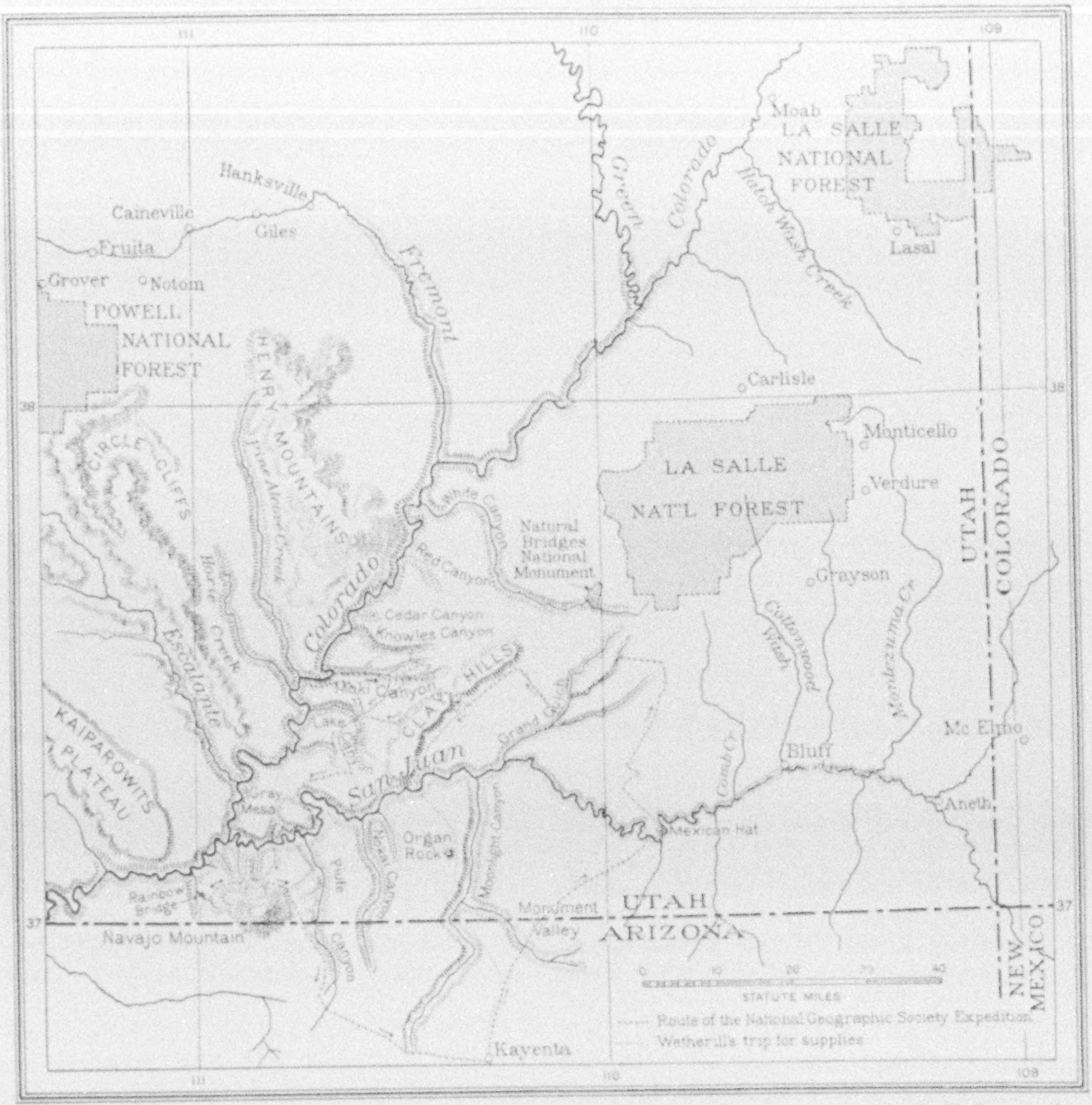
This unfrequented section in the angle of the Colorado and San Juan rivers boasts one upstanding landmark, the Clay Hills. Viewed from the south and east, the Clay Hills rise as an unscalable barrier of blue and gray shales and sheer sandstone cliffs. A single narrow gateway leads through and beyond this barrier.

From their cedar-crowned heights the Clay Hills slope gently down to the west, where lies the invisible gorge of the Rio Colorado; thence miles of pale yellow sand lift themselves slowly to meet a skyband of far-away cliffs, dimly purple through the distance. It is indeed a wild country and lonesome. Its very wildness adds to its solitude, as the latter emphasizes its awful vastness.

Here, in an area larger than the State of Connecticut, there resides no living soul. The silence hangs heavily. Roving, four-footed beasts of the desert are

---

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "The Great Natural Bridges of Utah," by Byron Cummings, February, 1910; "The Great Rainbow Natural Bridge of Southern Utah," by Joseph E. Pogue, November, 1911, and "Encircling Navajo Mountain With a Pack-Train—a New Route to Rainbow Natural Bridge," by Charles L. Bernheimer, February, 1923.


111
110
109
Moab
LA SALLE NATIONAL FOREST
Lasal
Green
Colorado
Hatch Wash Creek
Hanksville
Caineville
Giles
Fruita
Grover
Notom
POWELL NATIONAL FOREST
Fremont
HENRY MOUNTAINS
Pine Alcove Creek
Carlisle
38
Monticello
Verdure
LA SALLE NAT'L FOREST
CIRCLE CLIFFS
White Canyon
Natural Bridges National Monument
Red Canyon
Colorado
Horse Creek
Escalante
Cedar Canyon
Knowles Canyon
Grayson
Cottonwood Wash
Montezuma Cr.
UTAH
COLORADO
Moki Canyon
CLAY HILLS
Lake
Grand Gulch
KAIPAROWITS PLATEAU
San Juan
Comb Cr.
Bluff
Mc Elmo
Aneth
Gray Mesa
Organ Rock
Piute
Nokai Canyon
Moonlight Canyon
Mexican Hat
Rainbow Bridge
Navajo Mountain
Canyon
Monument Valley
UTAH
ARIZONA
37
NEW MEXICO
0 10 20 30 40
STATUTE MILES
Route of the National Geographic Society Expedition
Wetherill's trip for supplies
Kayenta

Drawn by A. H. Bumstead

A SKETCH MAP SHOWING THE ROUTE OF THE NATIONAL GEOGRAPHIC SOCIETY'S SAN JUAN EXPEDITION

rarely seen; yet their tracks, printed sparingly in the sand, recount the world-old story of the survival of the fittest—a soft-padded night prowler has found its prey and won an easy victory.

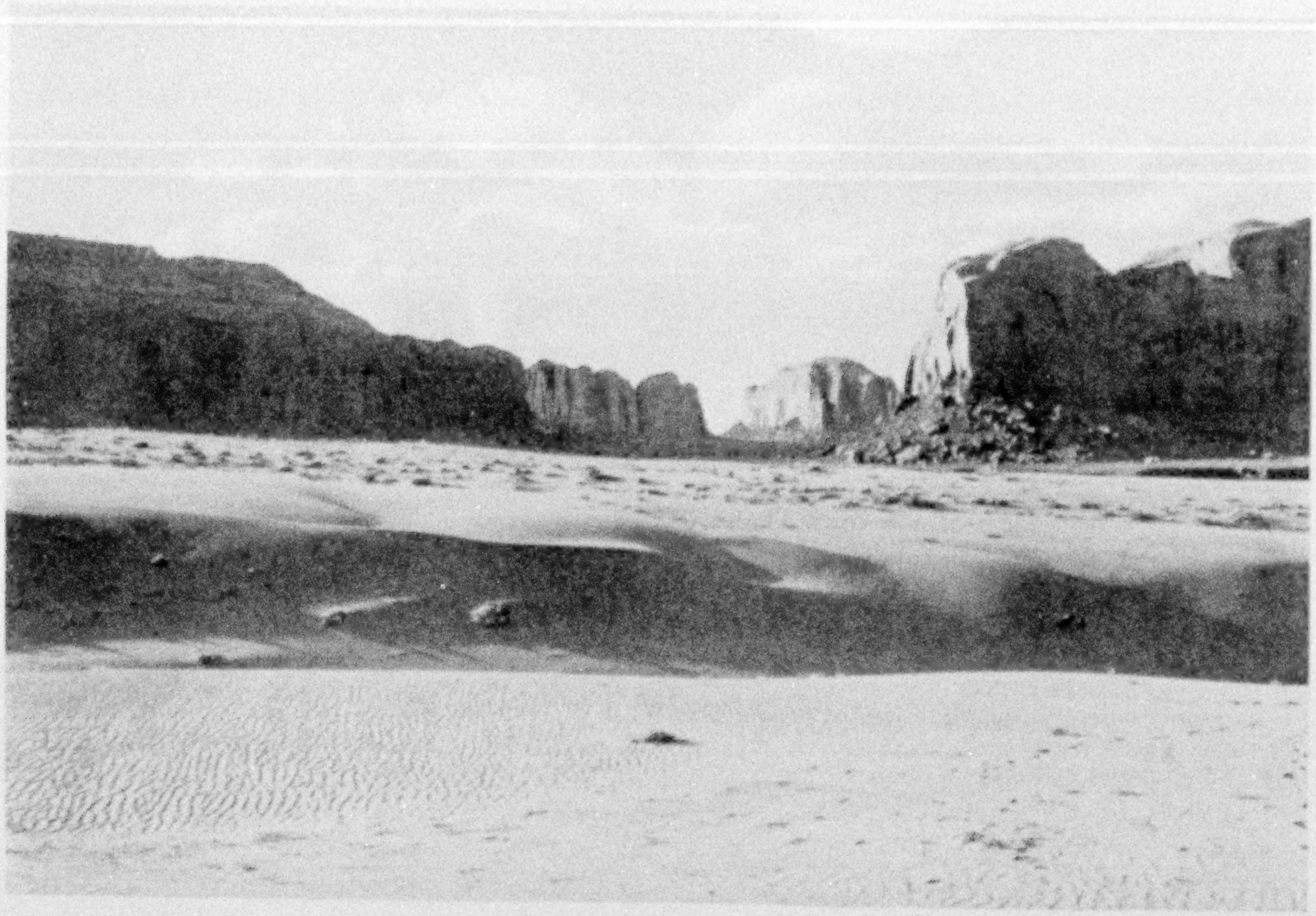
Even the birds seem to have deserted this strange country, for one sees but few, other than those noisy jays of the cedar ridges and the buzzards, circling ceaselessly in a turquoise sky.

MORMONS ONCE CROSSED THE REGION

Nearly half a century ago a band of Mormon colonists, guided by Piute Indians, who were later disowned, cut a bold path from western Utah, across the Rio Colorado and the Clay Hill divide, to the founding of Bluff. Descendants of the cattle these pioneers drove now forage the more favored uplands for an uncertain existence, but no trails lead westward into the deeper, more forbidding canyons.

Seekers after gold and, but recently, Government engineers have followed in the way of the indefatigable Powell, braving the whirlpools and rapids of the Colorado, climbing from its dark waters into the gaping mouths of its larger tributaries. But each had his own particular mission and did not wander far afield.

Our unexplored desert areas are savage, cruel, and unmerciful, however



Photograph by Edwin L. Wisherd

SHIFTING YELLOW AND ORANGE-COLORED SANDS IN MONUMENT VALLEY

Against a background of red cliffs and purple shadows, an Indian, in the middle distance, is resting on the trail across the dunes.

warmly they seem to welcome the newcomer. A single human life is as a grain of wind-blown sand—it comes, rests awhile, drifts on. And often, no doubt, the desert gods smile knowingly with each such passing.

At a San Juan ford some seventeen years ago I met a grizzled prospector with an unhurried burro, bound for the Henry Mountains. The Government maps he carried were recent and encouraged him, because they represented neither intervening hills nor valleys, to believe that his trail was an easy one, with no obstacles other than the Colorado itself.

Neither the old man nor his diminutive mule was ever seen again; both were sacrificed on the altar of those insatiable forces that rule the open spaces.

ONCE THE HOME OF PREHISTORIC PEOPLES

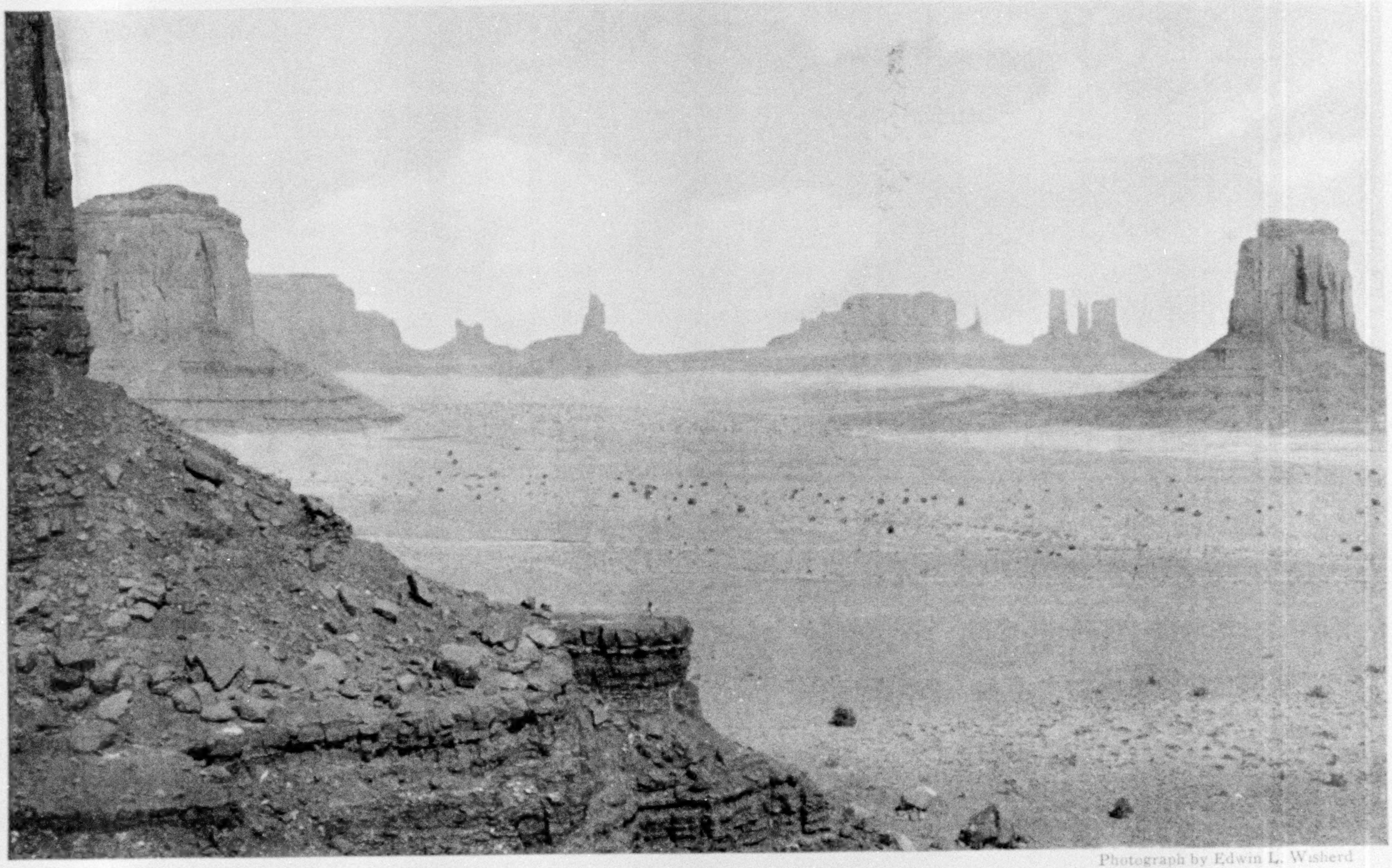
But, however deserted and silent this untamed country may seem to us, there was a time, uncounted centuries ago, when human voices echoed through the dark recesses of the canyons; when sandaled feet stalked deer and mountain sheep along their rocky rims. The crumbling walls of crude stone dwellings, blending chameleon-like with the variegated colors of the cliffs against which they cling, mark the temporary homes of prehistoric peoples.

Fragments of ancient pottery and flint chips discarded by the arrow-maker snap under foot as one climbs the talus to some yawning cave. And there, in the cool shadows, one observes the scattered ashes of former camp fires, the angular wall drawings of primitive artists (see illustration, page 290), and daubs of mud thrown against a cavern roof by children at play.

These ancient folk, safely cloistered in murky canyons, tarried but a short while; then moved on to a happier environment. Perhaps they, too, felt the crushing power of this lonesome land!

To neighboring Indians of to-day the uninhabited region west of the Clay Hills is a fearful place, the home of all-powerful, unseen forces. With the mountain sheep gone and the deer fast disappearing, few Navajo can be induced to venture

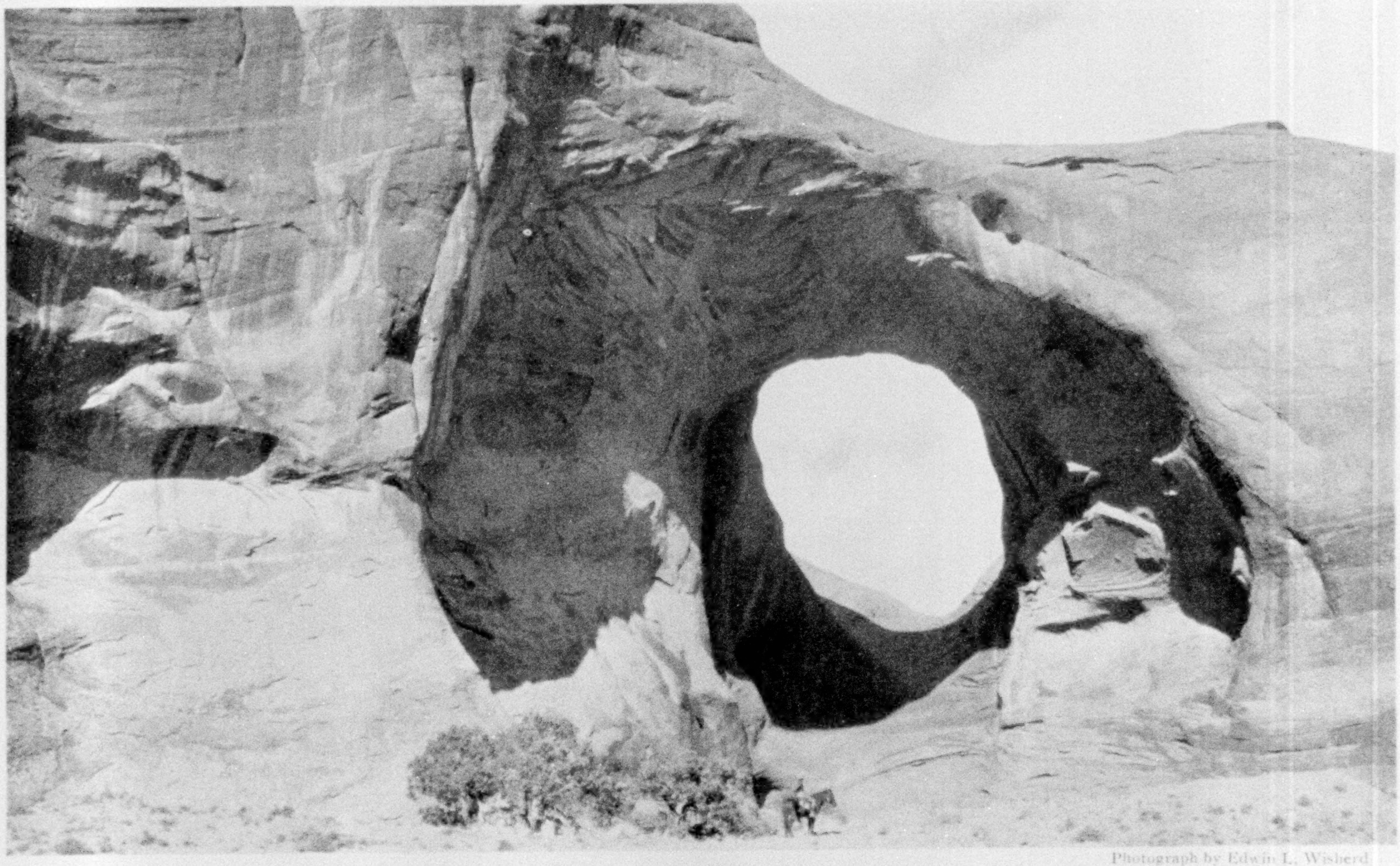
XUM



Photograph by Edwin L. Wisherd

MONUMENT VALLEY, PLAYGROUND OF THE DESERT GODS

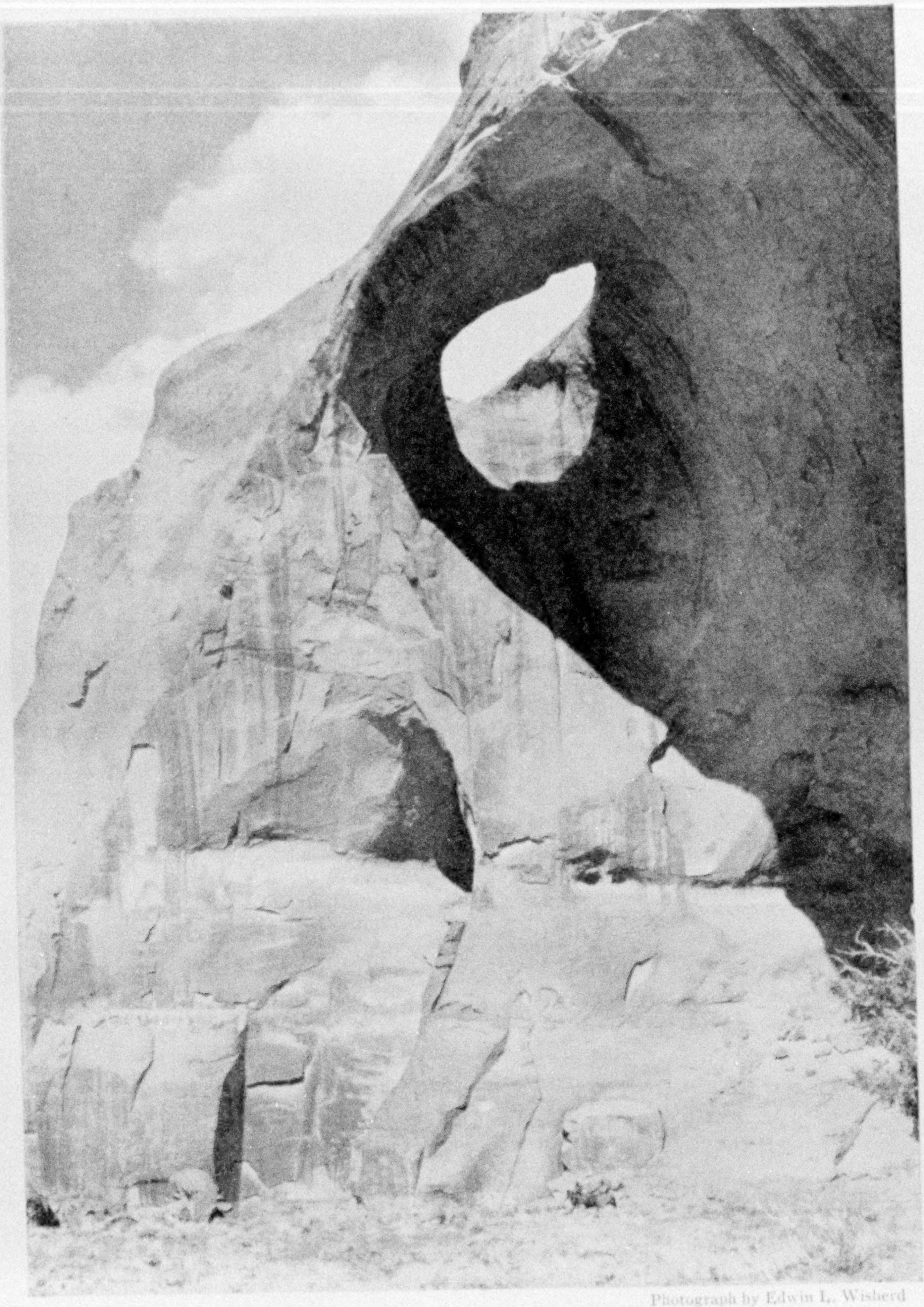
Here man is made to feel his comparative insignificance. Note the rider on the cliff in the middle foreground.



Photograph by Edwin L. Wisherd

WIND-BLOWN SAND HAS BEEN THE SCULPTOR AND TUNNEL BUILDER HERE: MONUMENT VALLEY, NORTHERN ARIZONA

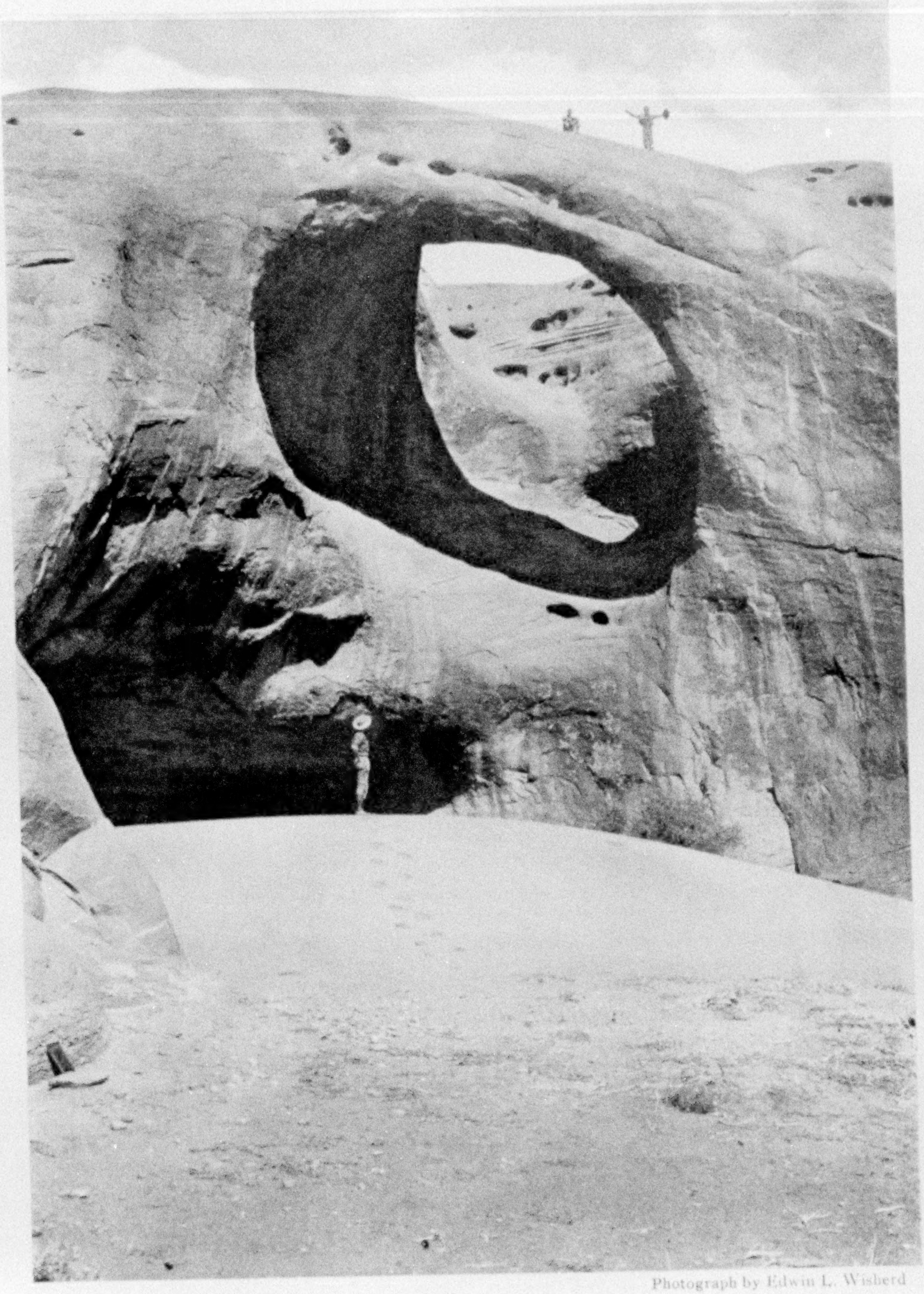
In the land of the red rocks one finds many weird fancies to excite one's wonder and increase one's awe (see also illustrations on pages 282 and 283).



Photograph by Edwin L. Wisherd

WIND AND SAND AND WATER HAVE JOINED FORCES IN AN EFFORT TO BREAK DOWN THE STONE BARRIERS SURROUNDING MONUMENT VALLEY

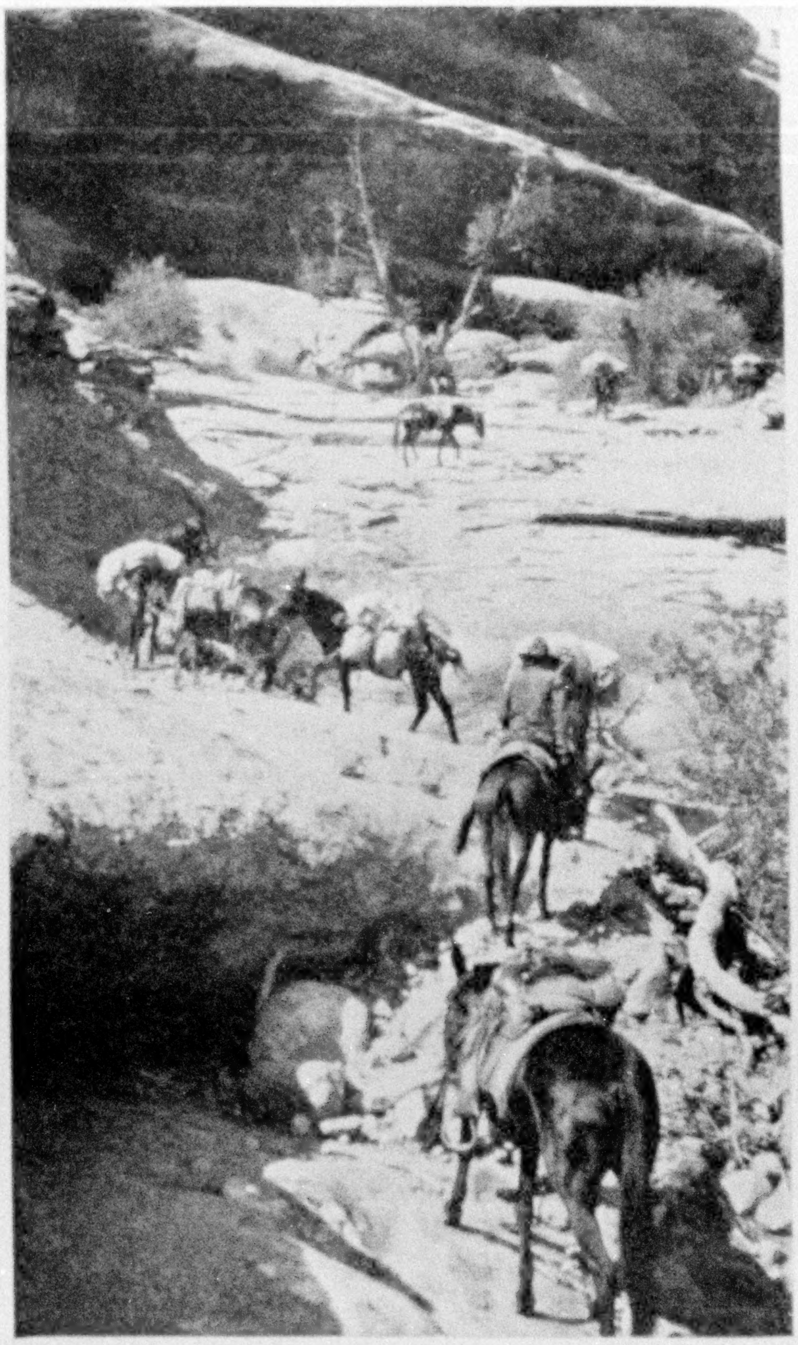
(SEE MAP, PAGE 278)



Photograph by Edwin L. Wisherd

CARRIED ON THE BREATH OF CEASELESS WINDS, THE FINE YELLOW SAND CARVES STRANGE WINDOWS IN THE RED WALLS OF MONUMENT VALLEY

(SEE ALSO PAGE 279)



Photograph by Neil M. Judd

THE EXPEDITION'S PACK-TRAIN IN GRAND GULCH
(SEE ALSO PAGE 285)

north of the Rio San Juan. The old warrior who was to have accompanied us on the reconnaissance slipped away to hide among the tall rocks on the very eve of our departure; a second Navajo failed to overtake our party on the trail, as he had promised to do.

FLOOD WATERS NECESSITATE DETOUR BY THE EXPEDITION

When we left Kayenta, early last October, the Arizona sands were still soaked with unseasonable and most unwelcome rains. Flood waters were racing down the San Juan. To have attempted to swim the river, as we had planned to do, would have been the height of folly. So we cut the number of our pack-mules to twelve, loaded seven of them with oats, and started for the swinging bridge near Mexican Hat. Because canyon trails are sometimes rough and accidents do happen, one extra mule was included in the train.

Four mules carried just enough rice and flour and coffee and bacon to assure each of us two meals a day for thirty days; and, since the law of brute force rules that strength shall prevail, it was mutually understood that that member of the party too ill at any time to reach for his biscuit and bowl of rice would find himself in an unfortunate predicament, to say the least. There was to be no breakfast in bed on this trip!

Among all the dude parties that have fared forth from Kayenta, none, perhaps, was so thoroughly mulified as ours. There were twelve pack-mules, biting and kicking and jockeying for position as loaded mules always will do when leaving the home corrals. Then there were four of us, and each sat astride a mule of untested individual habits, with shoulders hunched against a cold, drizzling rain that added nothing of joy to the early miles of our prospective journey.

Out in front, leading the pack-train, rode John Wetherill, guide extraordinary and master of the whole plateau country. Wetherill and I had ridden the desert trails together on other occasions, and I knew the mettle of the man. Where he started, there he went, if humanly possible to do so. And we were starting from Kayenta for a little ride beyond the Clay Hills, where few, if any, had ridden before (see map, page 278).

Forced from our intended path by unexpected floods, we trailed through Monument Valley, playground of the desert gods, and across endless mesas to the Rio San Juan. Even in October the valley was oppressively hot, with the midday sun flung smartly back from the shifting yellow sand.

XUM

Wind and sand and water have here been locked in ceaseless rivalry since the world was young. Hundreds of square miles of solid rock have been worn and washed away, leaving a rear guard of lofty red buttes pointing majestically toward the blue heavens. Here the elements have battled for superiority, and the wreckage of their long-continued strife is both a monument to the tremendous forces of Nature and a convincing reminder of the inconsequential capabilities of mere man.

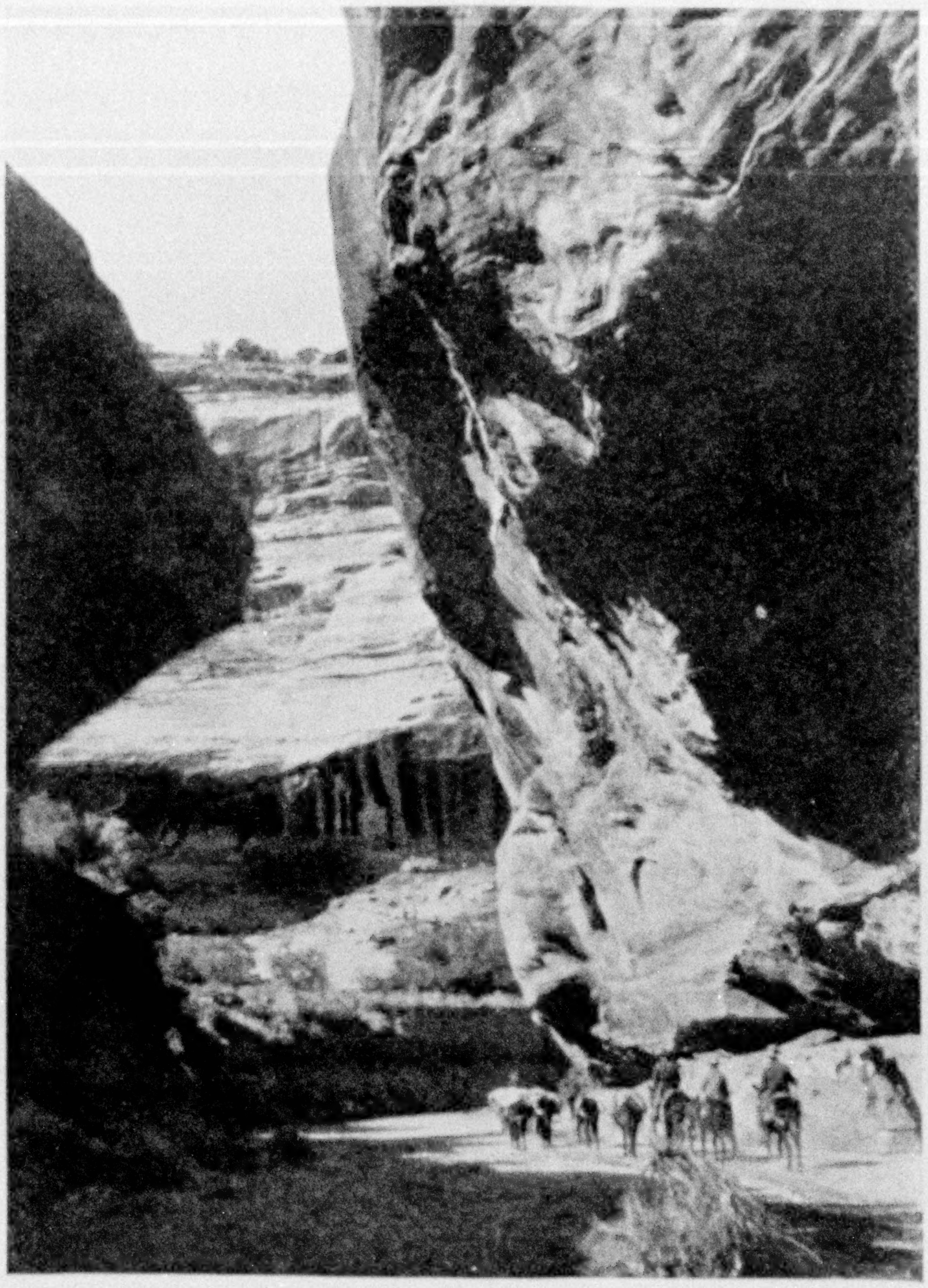
A PERILOUS TRIP FOR SUPPLIES

Ten days and 150 miles of trail brought us to a dripping seep on the west rim of Grand Gulch, with the red wall of the Clay Hills standing out boldly a short day's ride away. From this camp Wetherill turned down to the San Juan for a half ton of oats which Indians had agreed to deliver there. But he found no cache at the crossing and no recent signs of horses or men.

Realizing the Navajo had again failed us and cognizant of the hazard of proceeding farther without additional grain for the mules, Wetherill crossed the always treacherous river on a log; then, guided by the stars, walked 20 miles to a borrowed flivver and continued to Kayenta (see route, page 278). Our relief train had started on schedule, but had turned aside en route to attend a squaw dance; thereafter the urgencies of our expedition were forgotten.

Three days later Wetherill was back at the ford, with the much-needed grain and a new recruit. We never inquired how he had persuaded the Indian to accompany him, although we noticed that the Navajo feigned sudden and serious illness as soon as he learned just where we intended going. But we had burro steaks for supper that night, and after a full meal the native gave an attentive ear while we expressed the hope that he would cancel any business engagements he had made for the next few days and continue with our party.

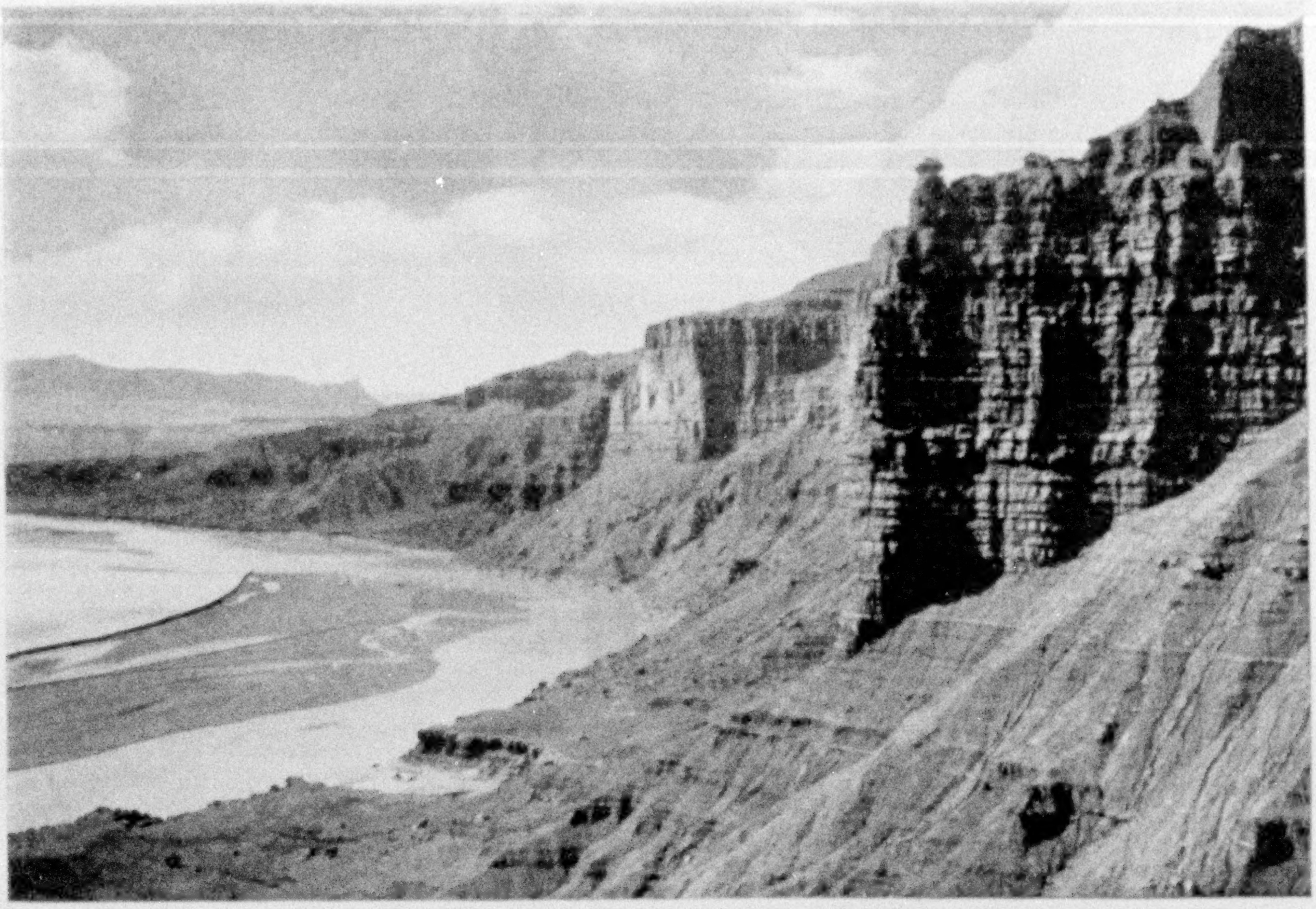
However dubious Cauz-zus-see may have been as to the wisdom of our venture,



Photograph by Neil M. Judd

DURING TWO LONG DAYS THE PARTY FOLLOWED THE TORTUOUS STREAM COURSE OF THIS ROCK-WALLED "DITCH" (GRAND GULCH)

Out of it an old Indian trail led over the rim toward the Clay Hills.



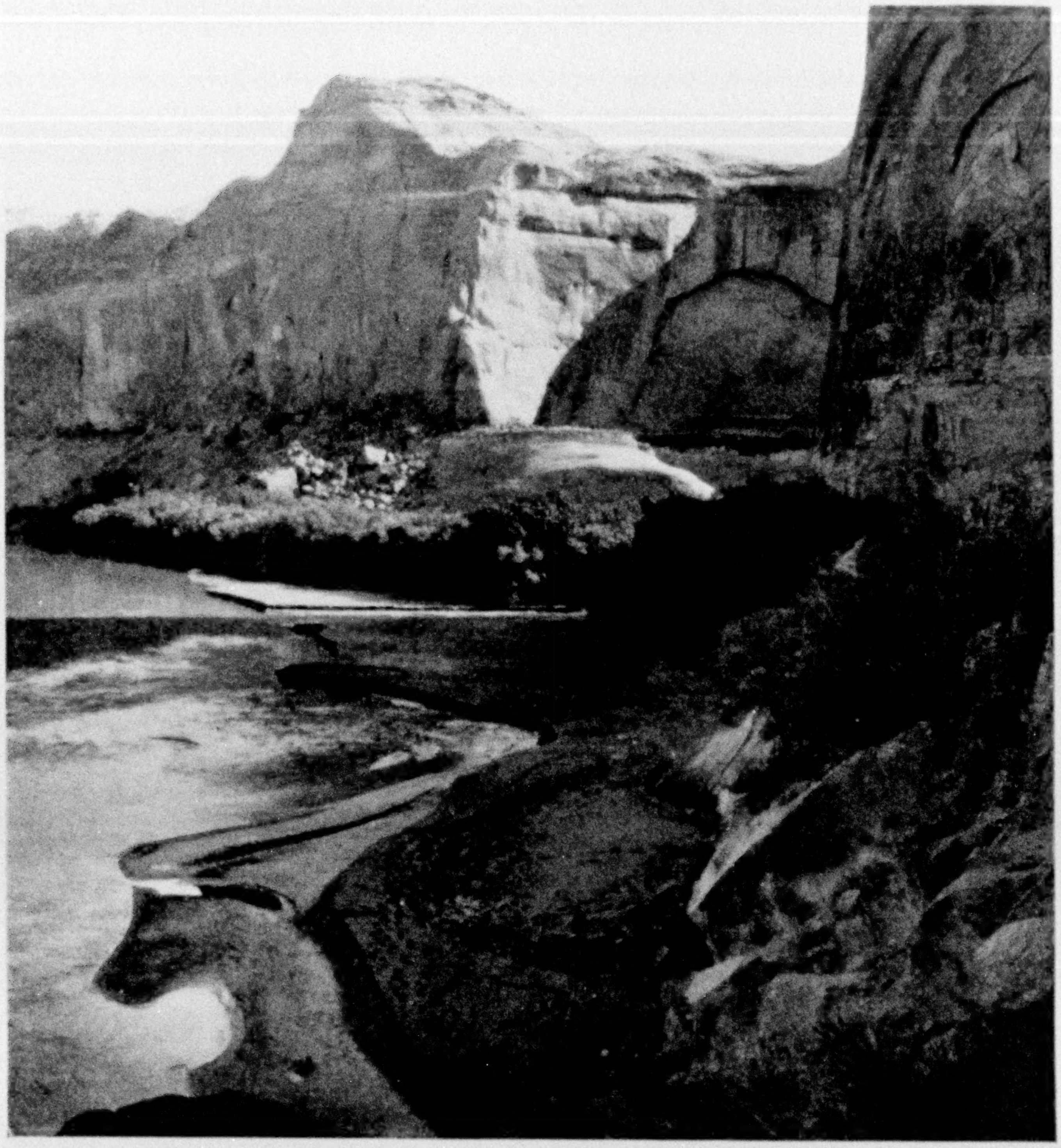
WHERE THE CLAY HILLS MEET THE RIO SAN JUAN

An unscalable barrier of many-colored clays and sandstones rising over 1,000 feet above the water. The pack-train was driven across the steep talus and down river for four miles to meet Wetherill returning with supplies (see text, page 285).

Photographs by Edwin L. Wisherd

BEYOND THE CLAY HILLS

Sand and sandstone reach out to meet the distant sky.



Photograph by Edwin L. Wisherd

WHERE MOKI CANYON JOINS THE RIO COLORADO

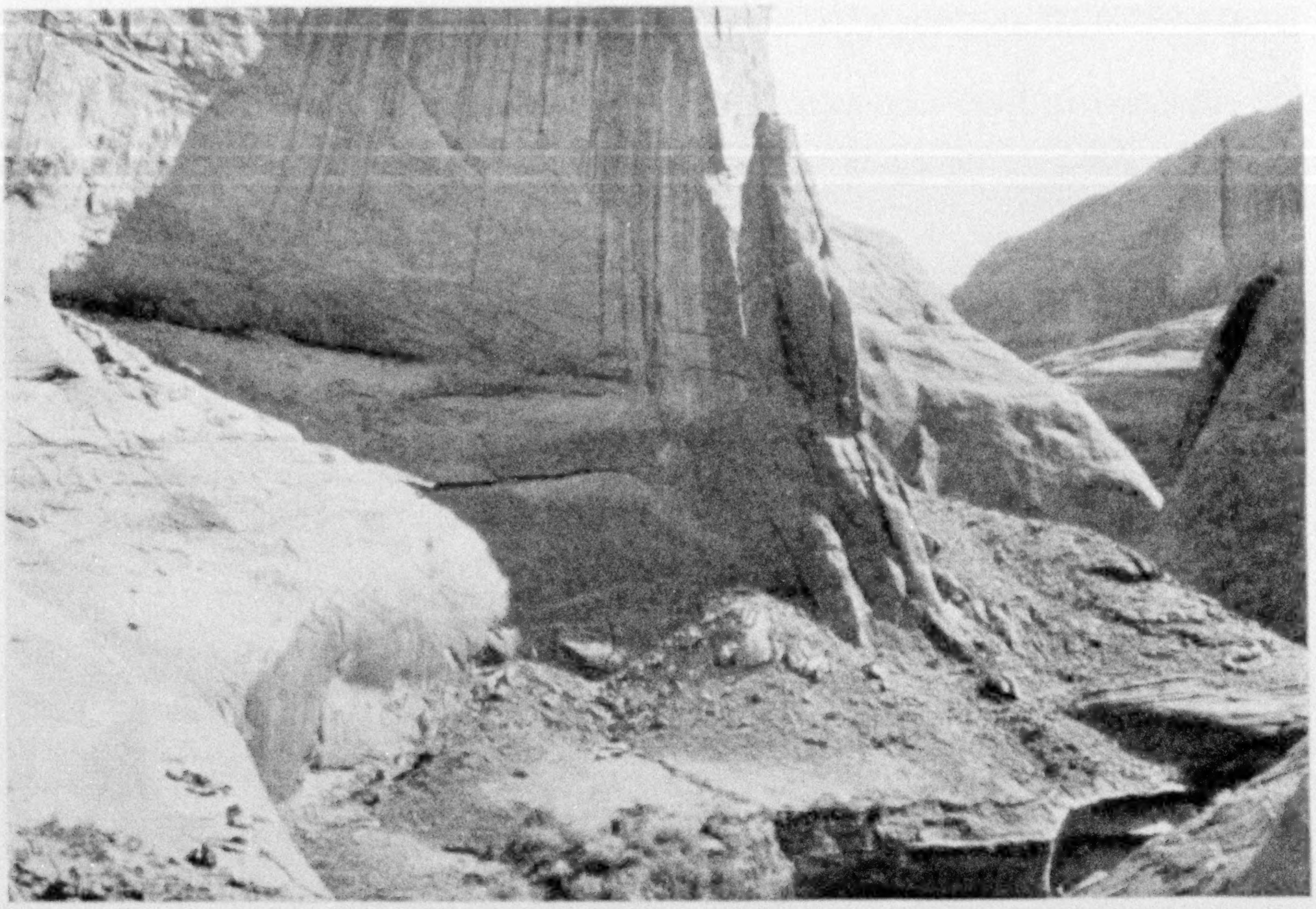
The "Silvery Colorado" is a dull red flood which carries heavy tribute of sand and clay from the four plateau States to the Gulf of California.

he soon proved a faithful and willing assistant. Personally familiar with only a small portion of the wild region beyond the Clay Hills, he yet retained vivid pictures of it as orally painted by older men. He found water in most unpromising places; he knew odd corners where our weary mules might graze contentedly for a night; but, somehow, his joy increased in direct proportion to the speed with which we traveled.

And when, a few days after we had forded the San Juan on our homeward journey, Cauz-zus-see galloped away light-hearted and happy to his hogan and family, the tall cliffs echoed the sharp minor notes of his buoyant trail song. He had returned in safety from the dwelling place of Evil!

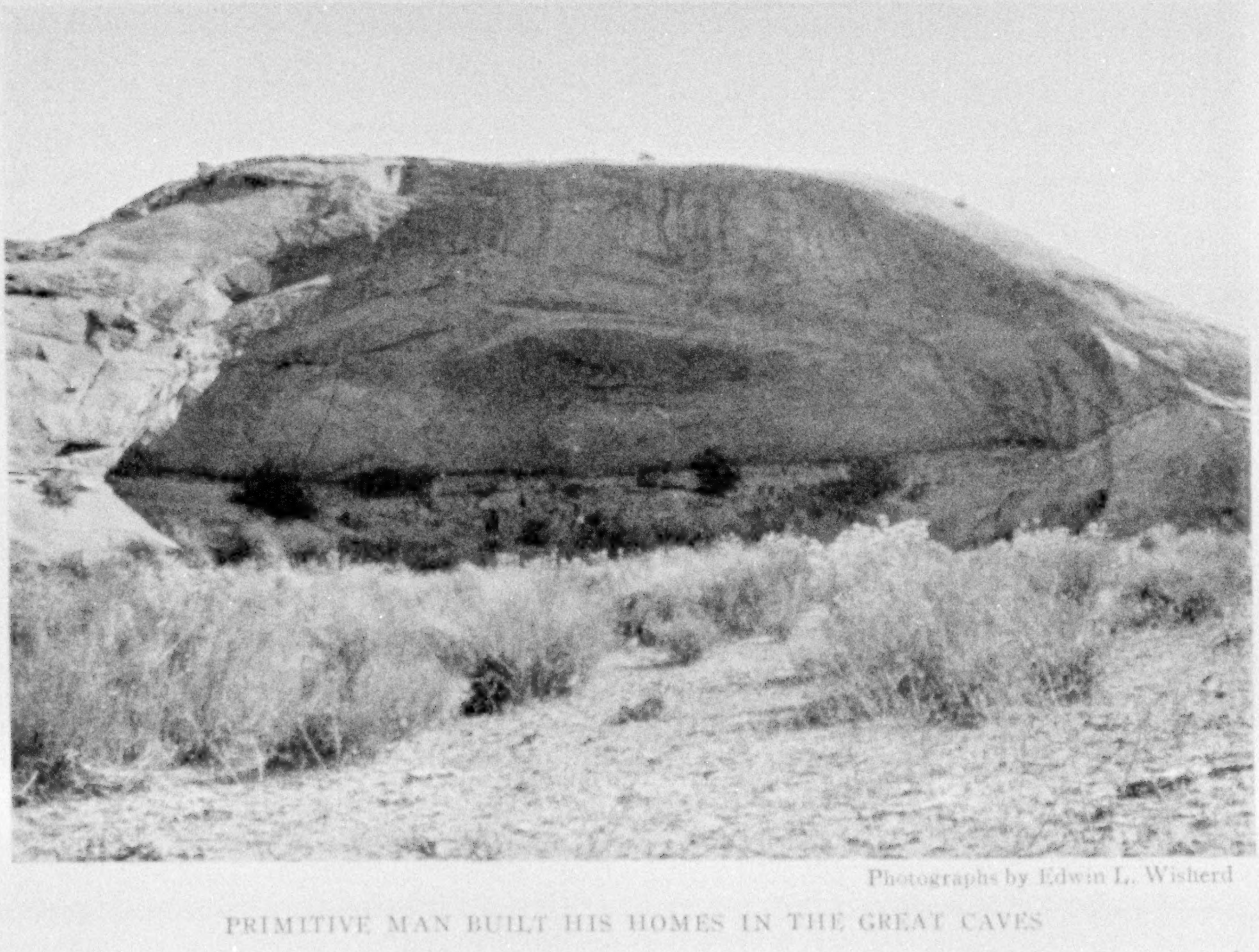
THE TRADITION OF FUNERAL PROCESSION TO THE HENRY MOUNTAINS

There is a dim, unverified tradition that the Navajo of old carried the bones of their dead warriors to a final resting place near the Henry Mountains. Elaborate



THE TWISTING WAY OF MOKI CANYON

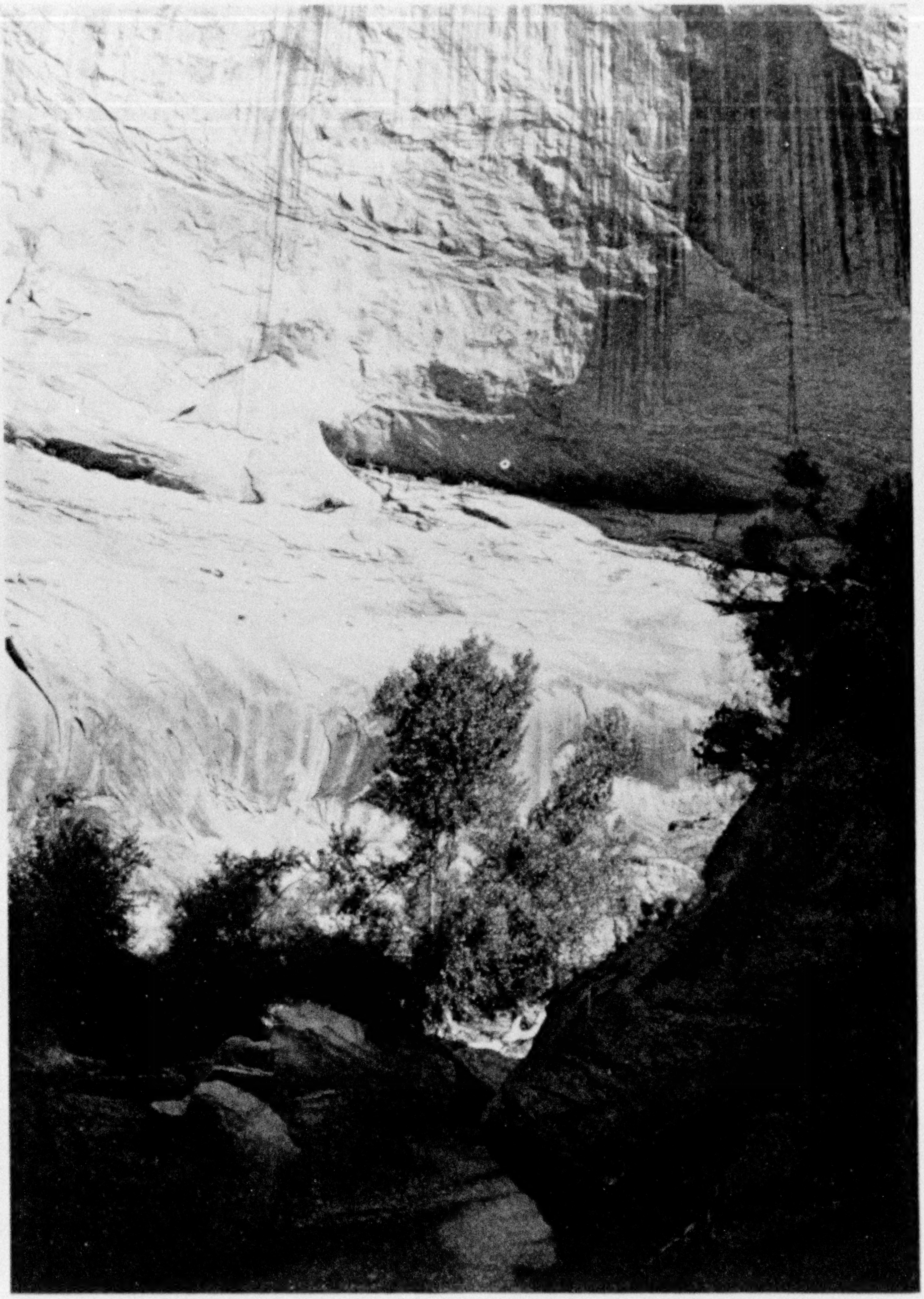
The Expedition followed a winding path for 18 miles through this silent canyon. In the cave at the left is a cliff-dwelling, and below it a series of steps, pecked with stone hammers.



Photographs by Edwin L. Wisherd

PRIMITIVE MAN BUILT HIS HOMES IN THE GREAT CAVES

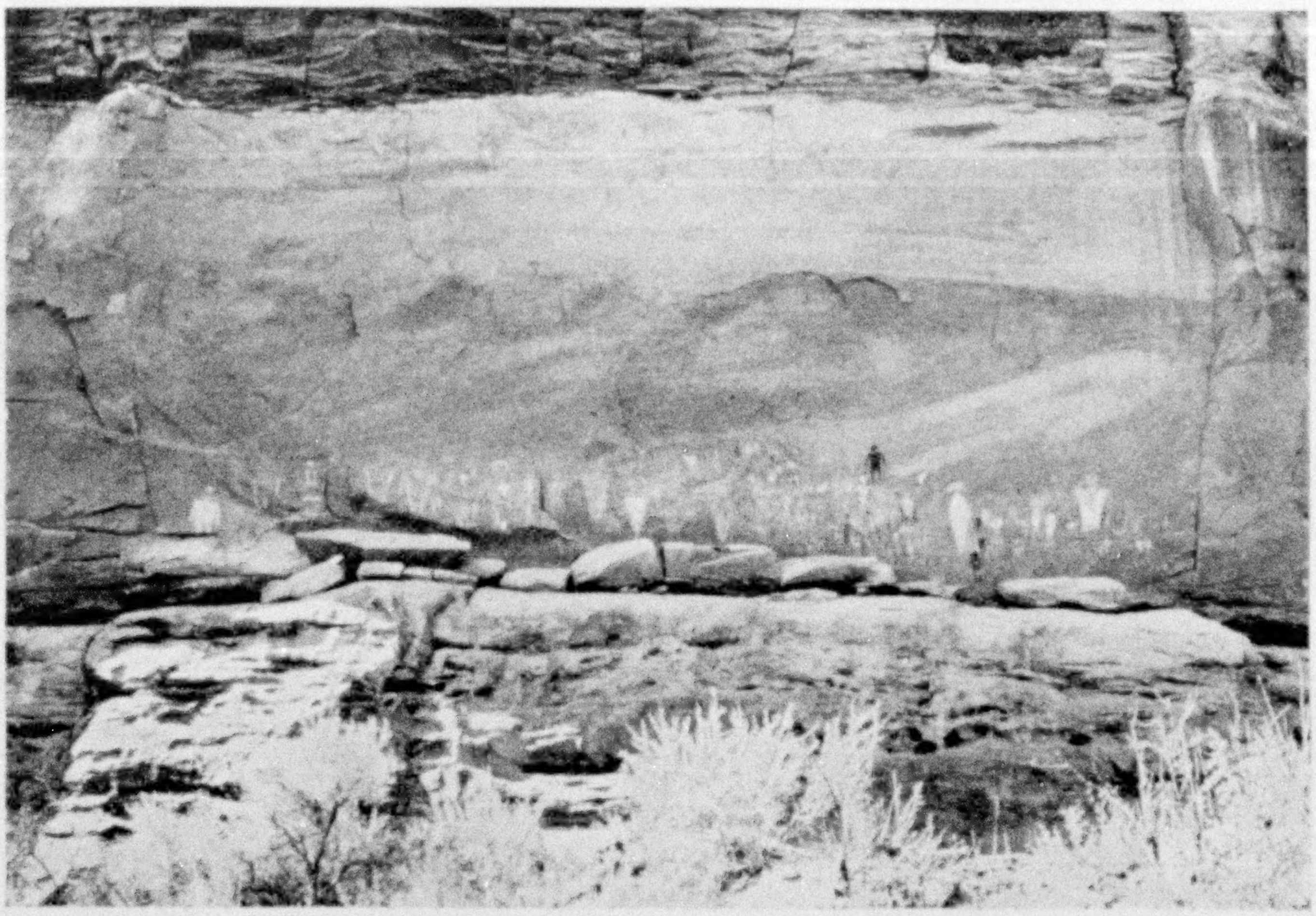
Those objects he lost or threw away hold much of his unwritten history. Note the mounted men at the edge of the cave shadow.



Photograph by Edwin L. Wisherd

AN ANCIENT RUIN IN MOKI CANYON

Like swallows, the prehistoric cliff-dwellers built cell-like homes high in the canyon wall, fairly secure from the attacks of Nature and their hereditary foes.



Photograph by Edwin L. Wisherd

PREHISTORIC ARTISTS, WITH A CLIFF FOR A CANVAS, DREW RED, WHITE, AND GREEN PICTURES OF ANIMALS AND SQUARE-SHOULDERED MEN IN WHAT IS NOW AN UNINHABITED LAND

ceremonies of prayer were enacted before crossing the San Juan and the Rio Colorado; other invocations were voiced as the carriers returned from their solemn mission. But these sacred rites are no longer performed; the requisite prayers have been lost with the fleeting years, for one-time bearers of the war shield are now few in number and their arrows lie broken.

If this suggested custom did in fact obtain in olden times, wherein lies its origin? Do the Navajo, in whose veins flows the blood of many captive peoples, trace some thread of their composite ancestry to the ancient cliff-dwellings that now crumble in the silent canyons far to the north? Strange places these and they prompt strange imaginings!

Prehistoric dwellings and the desert—they fit so well together! The desert appears to cherish those things which seem such an intimate part of it, and to reject speedily that which cannot know or understand its varying moods.

The great caves, with their abandoned camp sites, their storage cists, or their shattered ruins, tell a mute tale of human struggles long before the written history of our continent began.

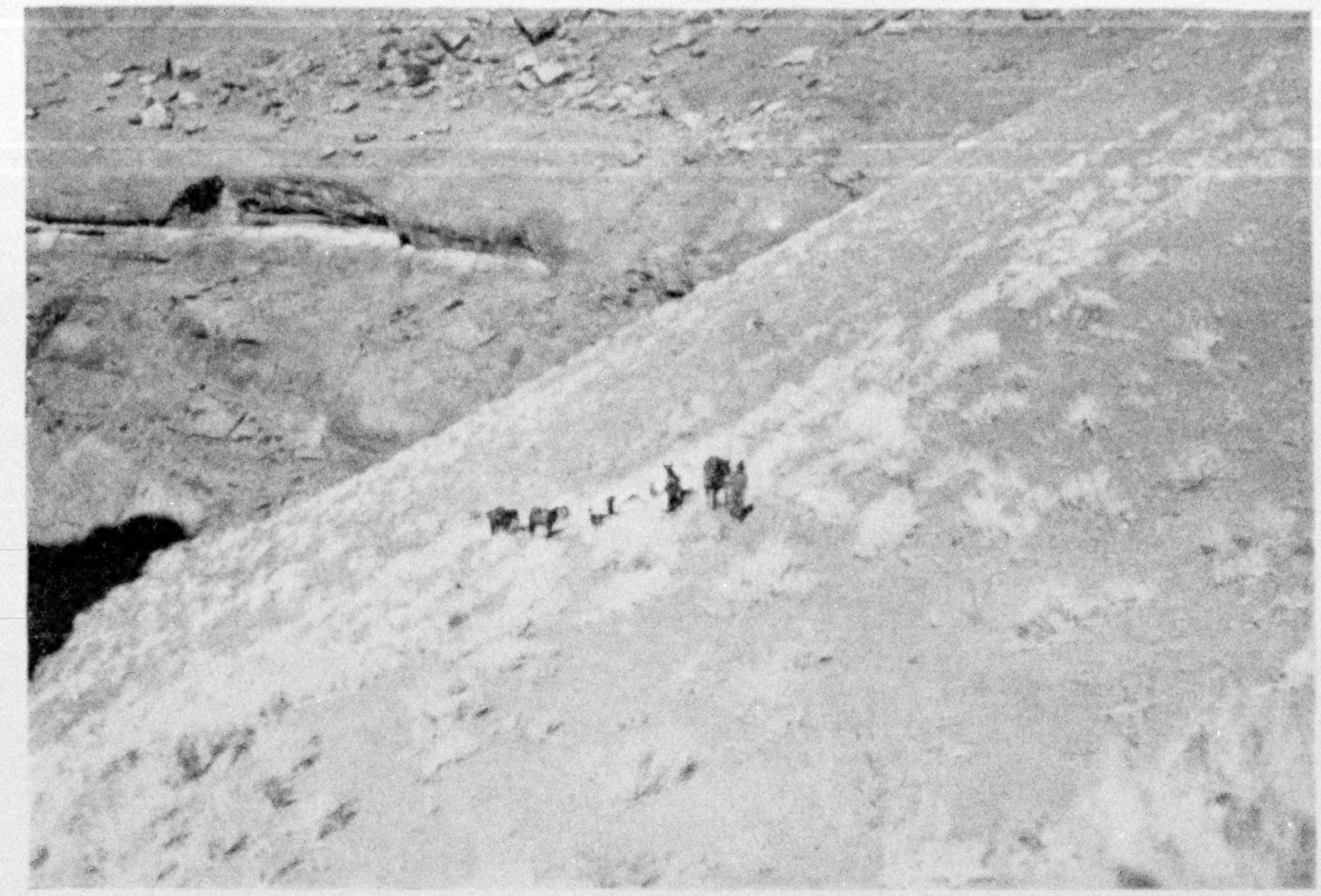
On this journey beyond the Clay Hills we traversed canyons perhaps never before visited by white men; we crawled through narrow doors into dwellings no booted foot had previously entered; we climbed canyon walls on trails unused for centuries.

The ancient cliff-dweller was kin to the lizard; a series of shallow holes pecked in the sheer sandstone cliff was the ladder by which he scaled prodigious heights. The unwatered, sun-lit mesas, the shadowy canyons—he took these for home and hunting ground.

But prehistoric man did not dwell long in the parched country west of the Clay Hills. His habitations there were mostly crude affairs; he built no colossal structures such as Pueblo Bonito* and Pueblo del Arroyo. Perhaps he realized the utter impossibility of conquering a coun-

---

* See the NATIONAL GEOGRAPHIC MAGAZINE for June, 1921; March, 1922, and July, 1923.



Photograph by Edwin L. Wisherd

A HUGE SAND DUNE FOLDED DOWN OVER A 500-FOOT CLIFF

This afforded a safe though toilsome way out of Moki Canyon.

try which remains to-day, centuries later, almost as wild and untamed as he left it.

IN MOKI CANYON, PLACE OF DEATH

Before starting on the recent reconnaissance we had been able to learn but little of the Clay Hills country, and that little later proved mostly to be erroneous. Moki Canyon, for instance, was represented as about five miles long and enterable, on foot only, in but two places. By boat, it was said, one could reach the slit through which Moki joins the Colorado; eastward, where a huge sand dune folds down over the rim rock, one could slide to the bottom of the gorge.

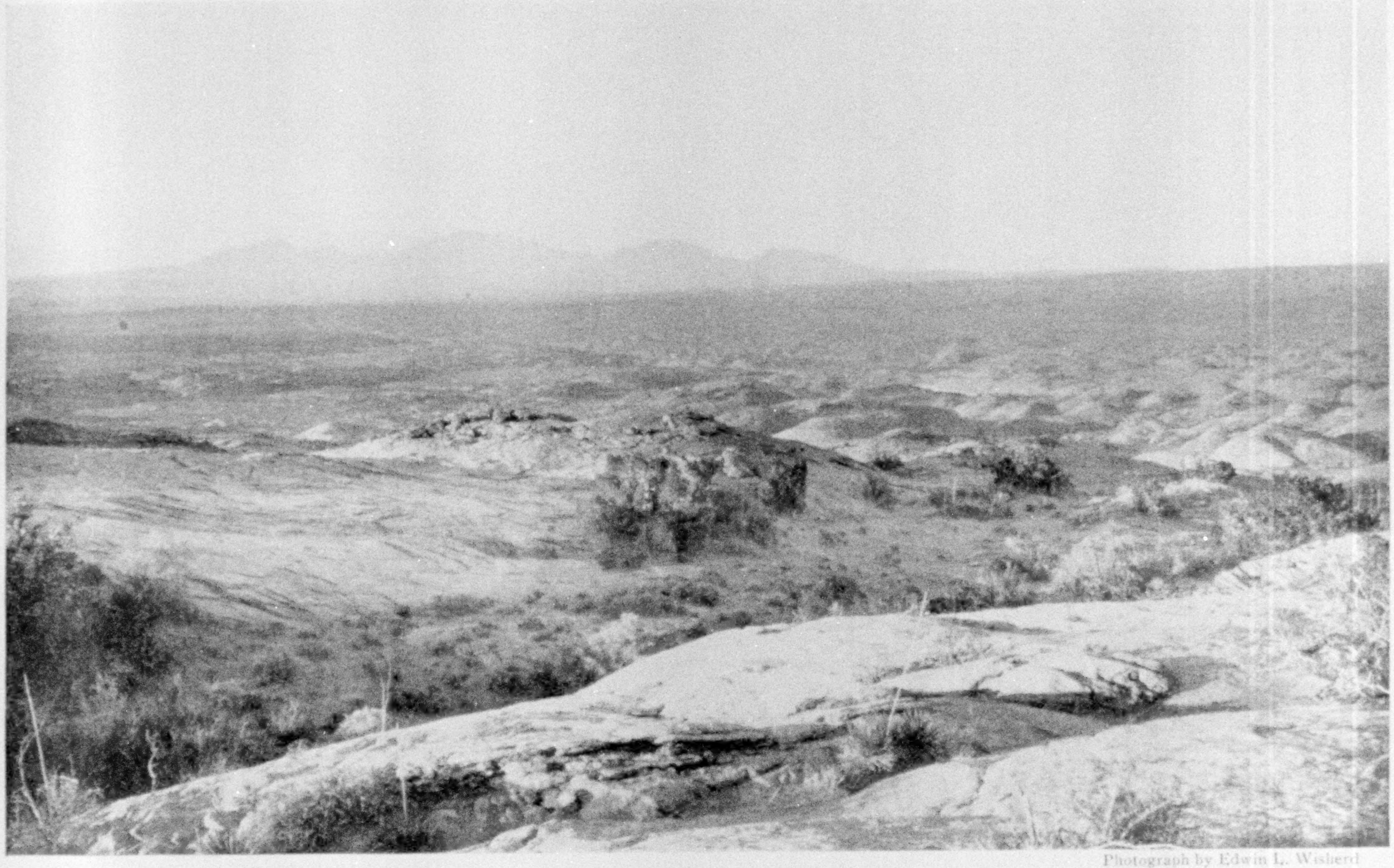
We made three camps in Moki Canyon, the last fully 18 miles above its mouth and perhaps two-thirds of its total length; we discovered old Indian trails—made, no doubt, by Navajo or Piute hunting parties—and took our mules up both the north and south cliffs. But this was not altogether easy; at times, indeed, it was a bit breath-taking.

Then, too, mules can be such perverse creatures. They will stop on the very edge of nothing at all to pluck a tuft of withered grass, with no thought for their companions, who may be holding a more precarious footing just behind. Although prepared for accidents and fully expecting them, our party seems to have been especially favored by the desert gods. We gave the password and advanced without fear.

When the going was too rough even for the mules, we reconnoitered on foot. Then, finally, as the whole country seemed to close in upon us, our colleagues were sent back with the pack-train to our main cache, while Wetherill and I continued alone.

For days we climbed canyon walls and crossed tiresome mesas, whose weathered sandstone glistened in the sunshine like whitecaps at sea. It is indeed a wild sort, this land beyond the Clay Hills, and destined always to remain so.

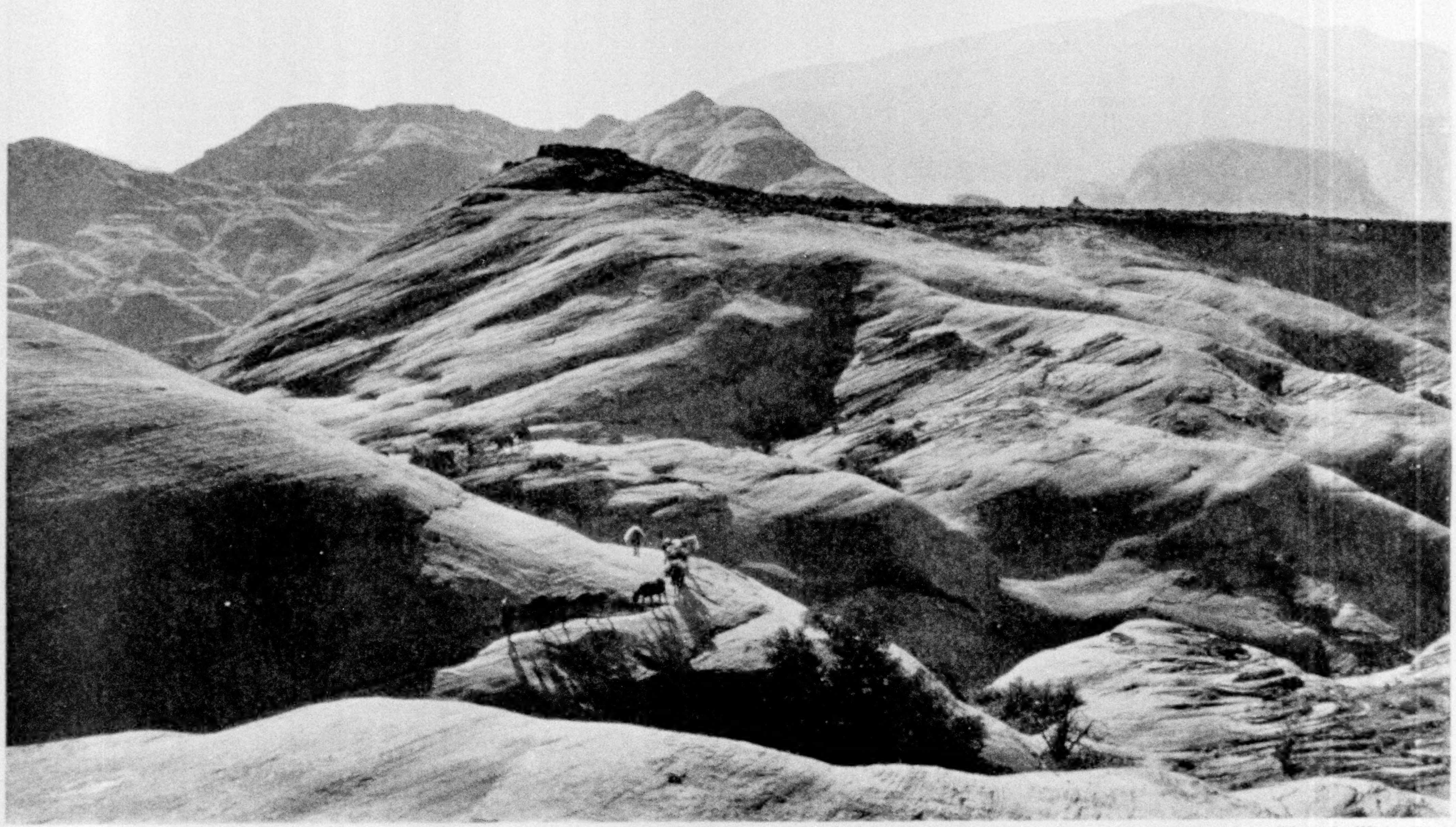
Once, in Moki Canyon, I noticed Wetherill check his horse suddenly; then press close to the left bank, as he circled a sheet of smooth, velvet sand beside a boulder that almost blocked the stream bed. Drawing quickly to one side and splitting the pack-train, I watched, with bated



Photograph by Edwin L. Wisherd

THE HENRY MOUNTAINS FROM NEAR THE HEAD OF MOKI CANYON

The Navajo are said to have taken the bones of their dead warriors across these barren wastes to a final resting place near the distant mountains (see text, page 287).



Photograph by Edwin L. Wisherd

THE EXPEDITION'S PACK-TRAIN "SNAKING" THROUGH THE SANDSTONE LEDGES THAT STRETCH OUT FROM THE BASE OF NAVAJO MOUNTAIN

Photograph by Edwin L. Wisherd

WHEN THE WAY IS SLOW AND THE TRAIL IS HARD

breath, the sandy basin grow more liquid and more elastic as each animal crossed.

Only Wetherill and the Indian sensed the full strength of those devils that lay waiting in that bed of quicksand. Two short spans to the right, and mule or man would have been clasped in a viselike grip of unbelievable power.

Moki Canyon, place of the dead! Like the Venus flytrap (*Dionæa muscipula*), whose sticky leaves fold down upon the fluttering wings of a careless insect, the quicksands of Moki Canyon patiently wait to embrace the blind or heedless passer-by.

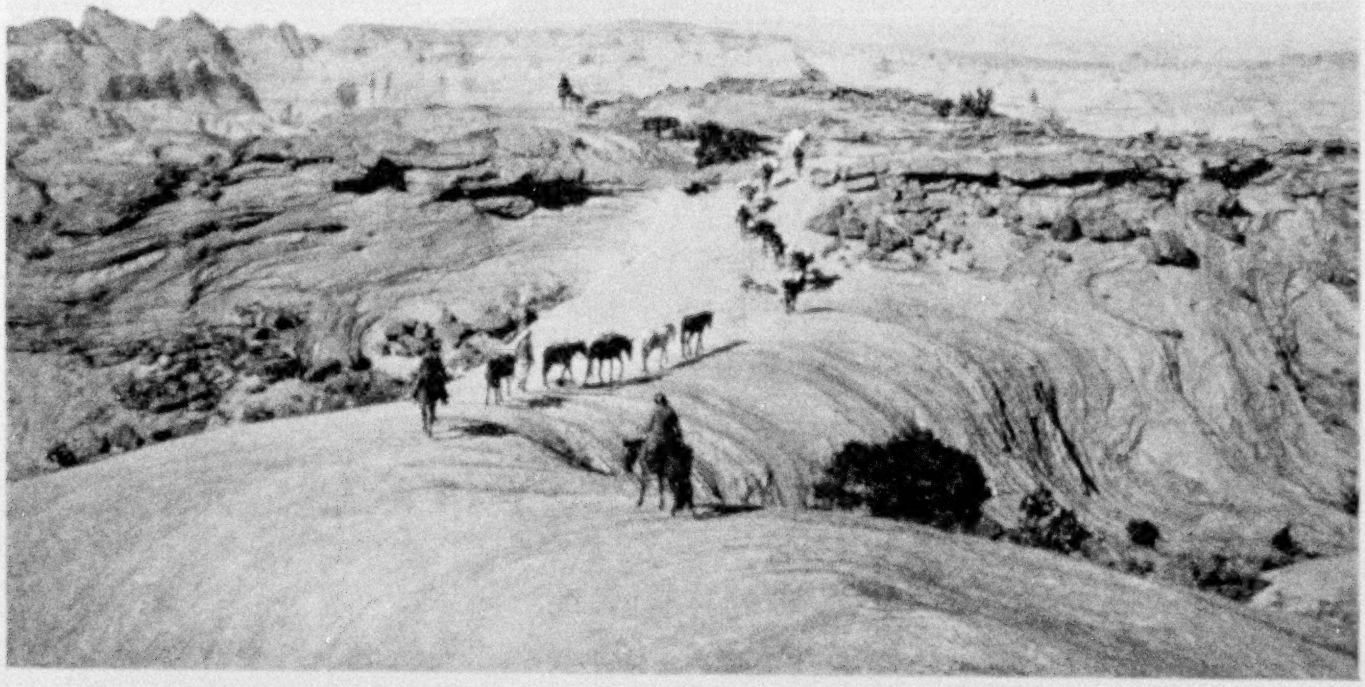
Under the quick steps of our mules, those treacherous sand pockets swayed and stretched like huge sheets of yellow dental rubber; beneath each thin, vibrant surface lay slow, cruel death for the unrescued. But we went through—the first pack-train to dare—through 18 miles of it, building trail when necessary, accepting risks that could not be avoided, curious as to what the next mile would disclose.

We had other experiences with quicksand, the last while fording the Rio San Juan on our homeward way. In this latter struggle Bino was the principal actor. Bino, the Beautiful! He was a wild little devil of reddish-brown color and he could kick you twice before you could get out of his way. His was a double-barreled attack. No one ever saw him raise those quick hind feet or put them down again. He just kicked, kicked twice, and, when necessary, he repeated.

THE STORY OF BINO, THE BEAUTIFUL

The trail we were following had been made by hunting parties in those glorious days when game was plentiful: when Navajo and Piute warriors, in a friendly sort of way, used to steal each other's women. The trail circled the south edge of Gray Mesa, wound through ragged canyons, and then dropped—I cannot recall that last thousand feet—dropped to the very edge of the drab, brutal river.

Cauz-zus-see was sent in to "feel" the crossing. He walked up and down, back and forth, in the icy waters; they were about four feet deep. Now and then he jigged a bit, testing soft spots his feet searched out. Quicksand could not be avoided entirely, but the safest path was marked. Straight across to the big riffle,



Photograph by Edwin L. Wisherd

ON THE TRAIL TO RAINBOW NATURAL BRIDGE

Where Nature builds fences Man walks antlike along their tops to reach forbidden fields beyond. Kaiparowits Plateau (see map, page 278) shows dimly in the distance.

then down current with it, gradually seeking the shore!

The mules were bunched and crowded in, close on the heels of the Indian's horse. Cold, muddy water chilled their flanks and rolled up against their heavy packs, but on they pressed, seeking to escape the unfamiliar shouting and swinging of ropes at their rear. There was a degree of frightened plunging, of snorting and throwing of water, as mule after mule broke through the thin river bed and struggled on.

Then Bino went down, both forefeet at once. He squealed in fright and jerked back; the waves bowled him over; and with head under water he splashed and flopped and floundered around until shortly his efforts ceased and he floated on with the heavy current.

Help for the red mule just then was impossible. The other animals were already in the main channel, with liquid sand underfoot. Better lose one than a dozen, even though the lost mule did carry every cup of flour in the outfit! Wetherill hesitated a bare second; then, with a savage yell, forced his black horse against the stragglers. These lunged forward, crowding closely upon the Indian, as he guided them to shallow water and a boulder-strewn bar left by the summer's floods.

But Bino had one kick left! He delivered this as his trail companions neared the sheltering south shore. At a shout, the Navajo rushed back and pulled the mule's head above water; willing hands soon loosed the ropes and carried the soaked pack ashore piecemeal. The half-drowned creature was too weak to stand without aid, yet he blew spray like a sulphur-bottom whale.

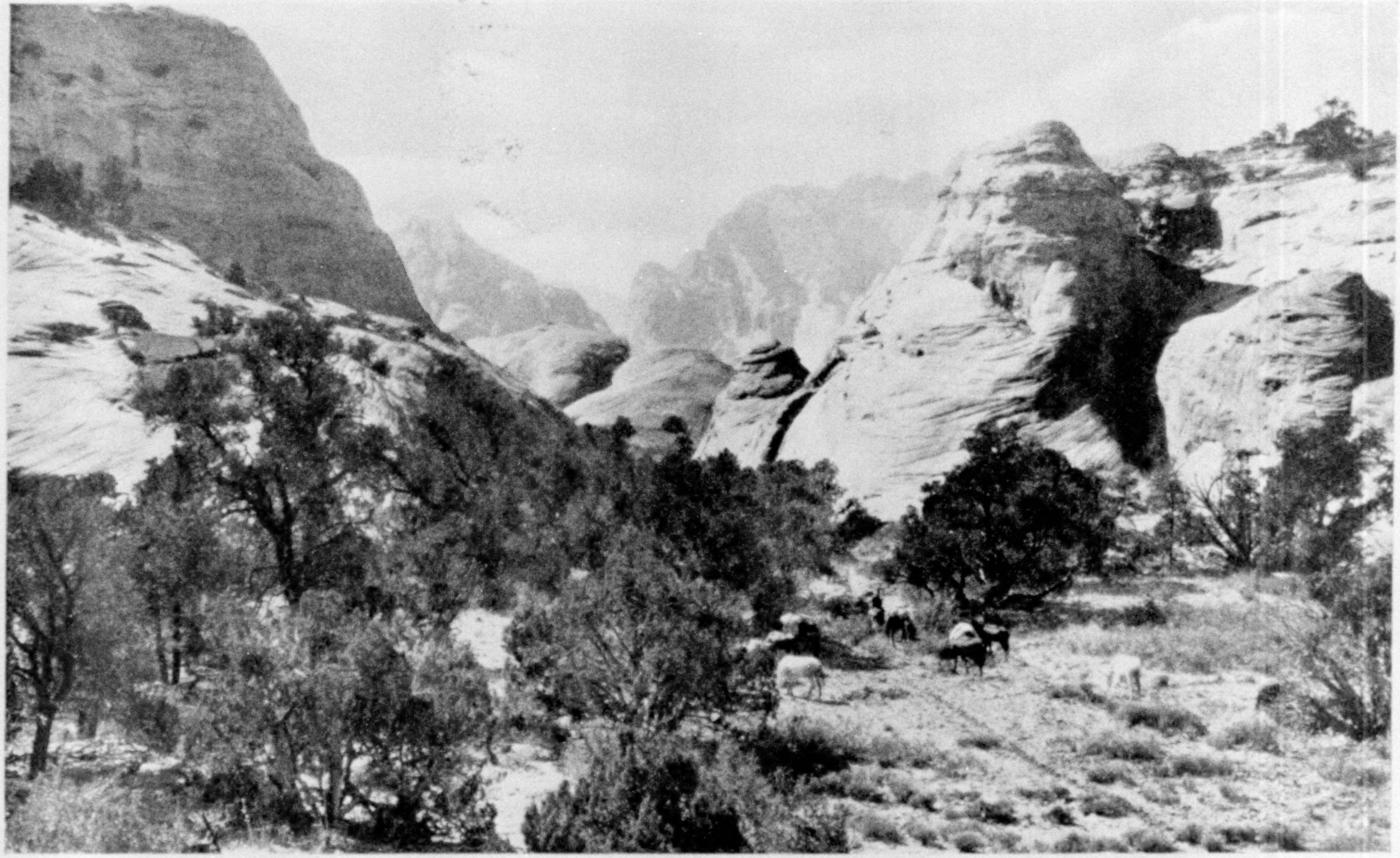
A few moments later, when he went down again and floated out to the end of his hackamore, he was literally towed to the water's edge, set on his feet, and roundly cursed, however dejected and bedraggled he appeared at the moment. Bino was no longer beautiful!

Our flour was thoroughly wet and one sack had been lost; Bud's bed was drenched and mud-soaked; and there was not even a kodak to witness the crossing!

Photograph by Neil M. Judd

ALONG A NARROW PATH IN BRIDGE CANYON

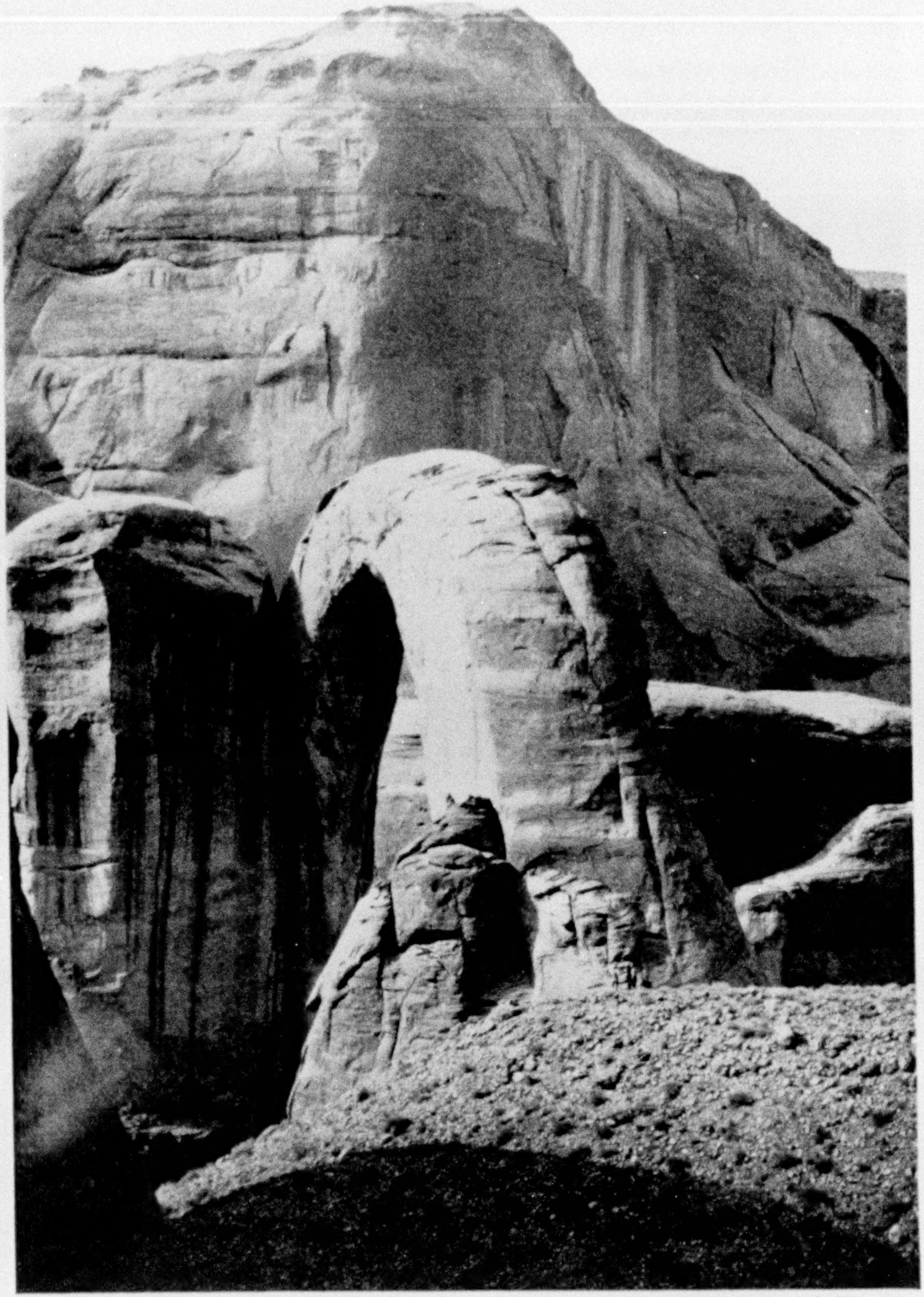
On the way to Non-ne-zo-shi bo-ko, canyon of the stone rainbow.



Photograph by Edwin L. Wisherd

SURPRISE VALLEY

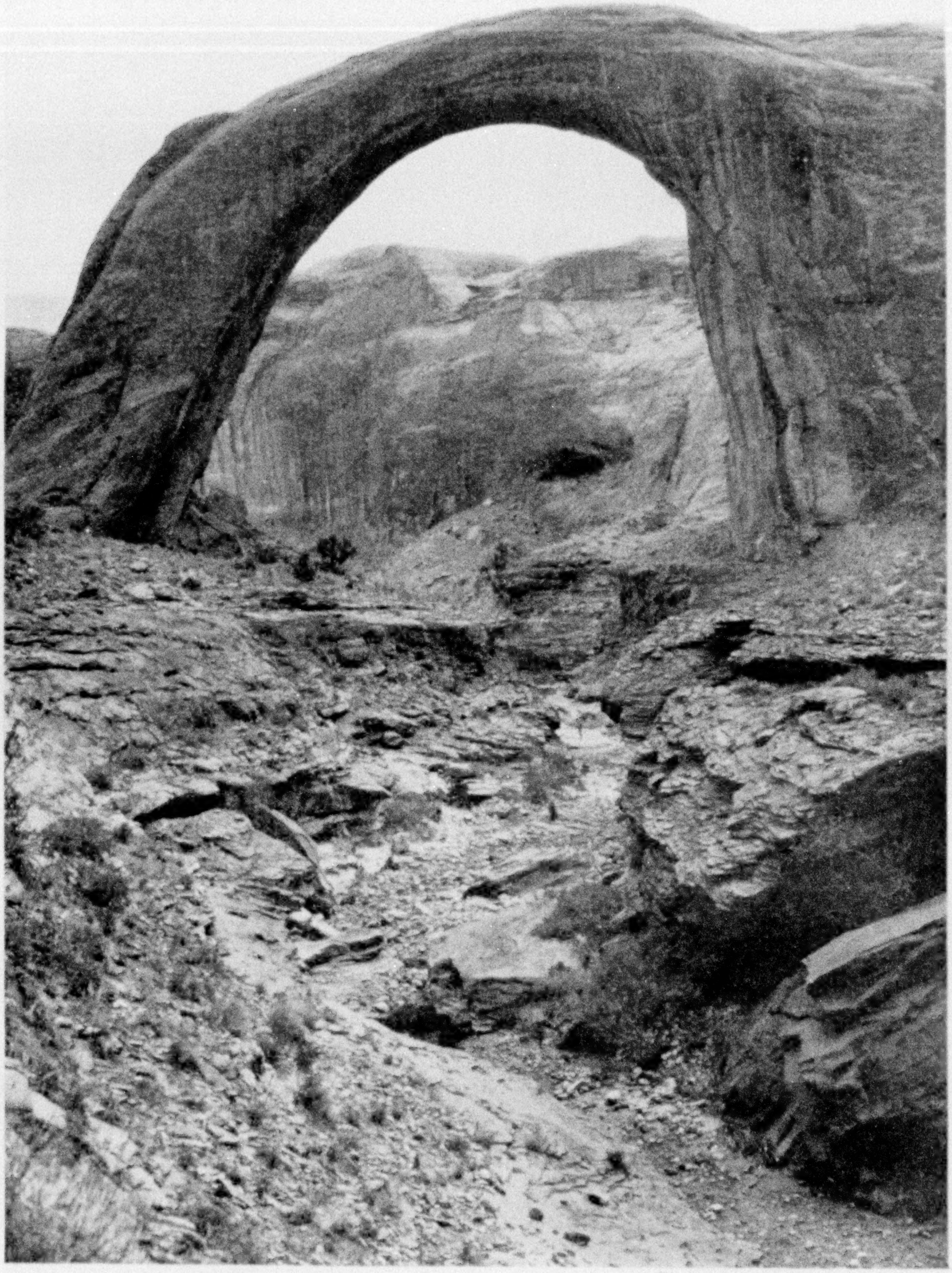
Made famous through the writings of Zane Grey, this spot offers the most restful and refreshing camp ground between Kayenta and the Rainbow Bridge.



Photograph by Edwin L. Wisherd

THE RAINBOW NATURAL BRIDGE

The men standing at the upper base of the great arch afford some slight conception of its massive proportions; yet the "bridge" is dwarfed by the walls of the canyon itself. Devout Indians will not pass beneath the arch without saying prayers to their Supreme Being.

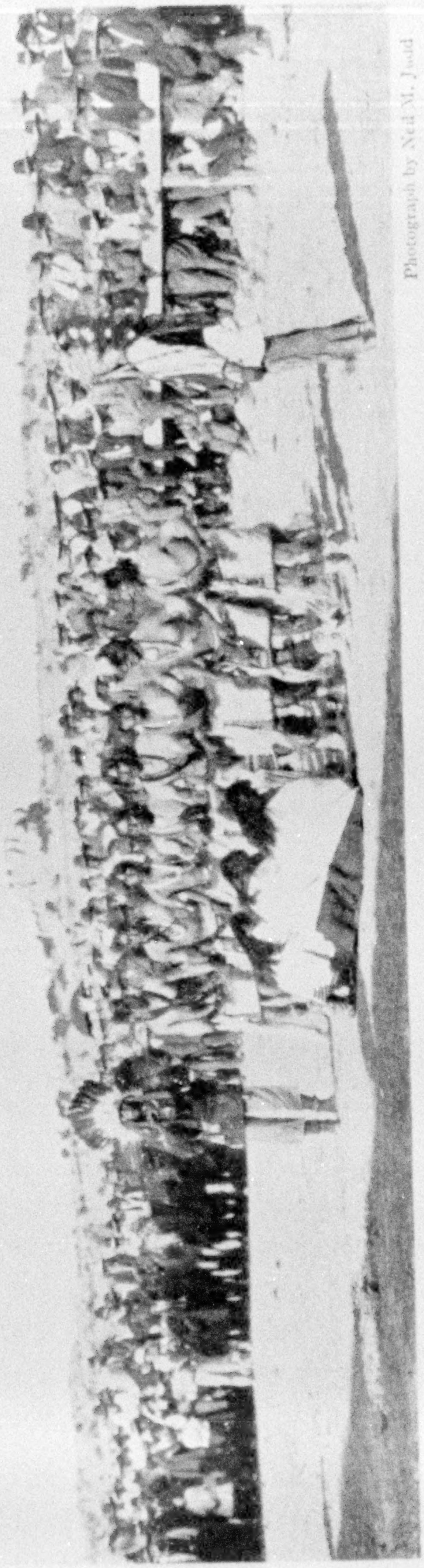


Photograph by Edwin L. Wisherd

LOOKING THROUGH THE RAINBOW-TURNED-TO-STONE

According to Navajo mythology, a rainbow was here turned to stone, thus permitting certain hero gods to escape flood waters in the canyon. An ancient shrine still stands beneath the left-hand buttress. Note the man on the white rock in the gorge.

XUM



Photograph by Neil M. Judd

BASKET DANCE OF THE TEWA INDIANS

Each fall a "ceremonial" is held at Gallup, New Mexico, when neighboring Indian tribes join in friendly competition to determine not only which one presents the most beautiful native songs and dances, but also which village has made greatest progress in the crafts of the white man.

Always the pictures one especially desires are lost! This particular day was cloudy and dull and a misty rain was falling to prevent use of the cameras. But similar misfortune had greeted us so frequently before. Only the previous day, trailing along the thin edge of Gray Mesa, we glimpsed floating bits of most marvelous panoramas, screened by a dense fog that rode on the canyon winds and at times actually hid the guide from those who followed at the end of the pack-train.

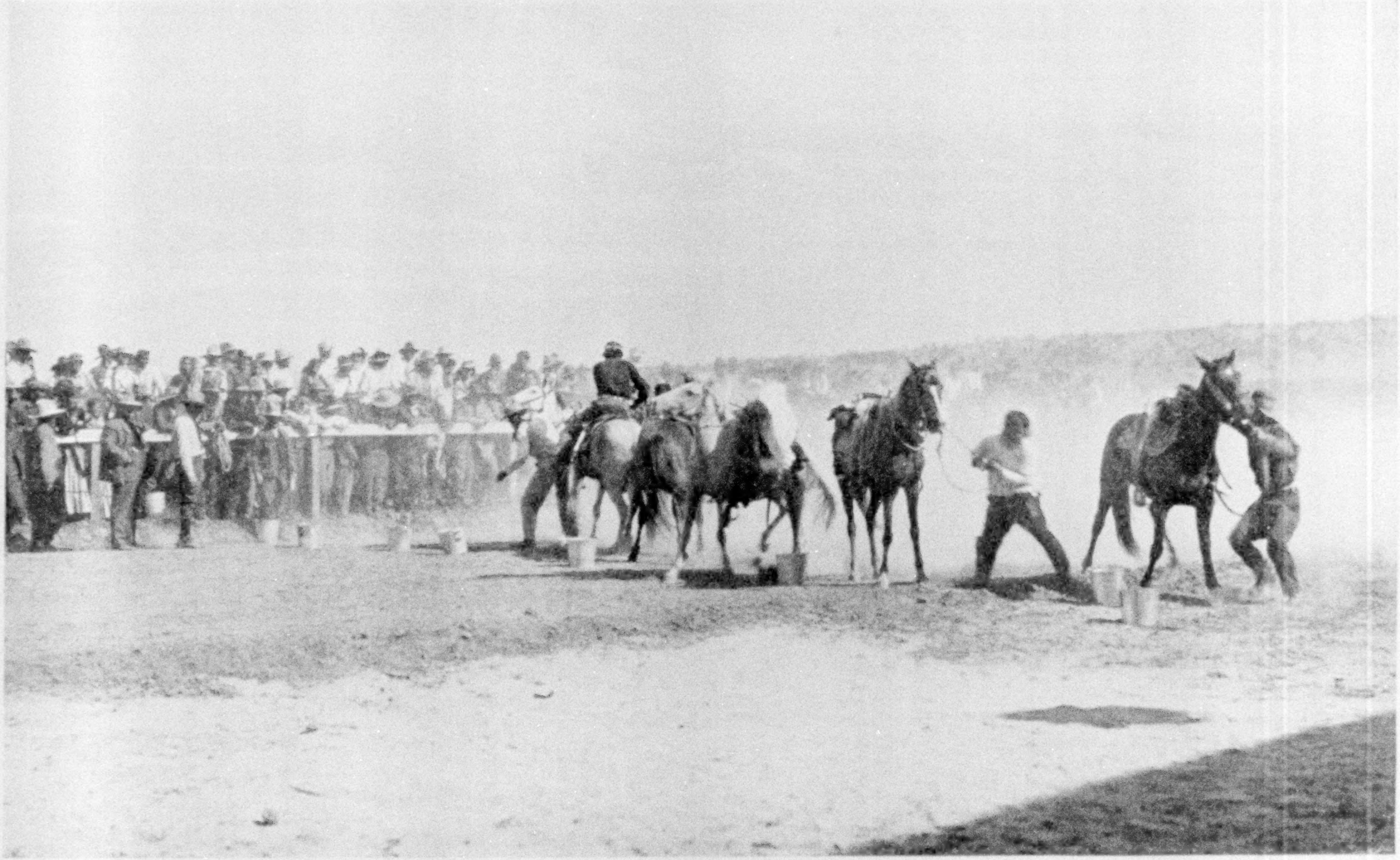
What wonderful paintings were shielded from us on that bleak rim rock we may, perhaps, never know; but we could sense them. To the north the endless yellow vast, gutted by twisted canyons, we had but recently left behind; toward the south the broad bulk of Navajo Mountain, home of the gods, pivot on which many native legends turn; east and west reached the sheer canyon walls of the San Juan, with its sullen current coiling slowly and silently far below, like an arm of a gigantic octopus.

But when the clouds are heavy and hang low one cannot take pictures, and when the mules are in the quicksand one does not think of pictures, until afterward. And for this reason photographic records of exploration journeys are usually incomplete.

TRIALS AND DISCOMFORTS OF THE TRAIL

Never were rains more persistent than last year! They began in midsummer, which is proper, and continued until early November, which is not at all as it should be. At the very beginning of our expedition, high water in the San Juan forced a long eastward detour. Storm clouds camped with us frequently, and then, as if loath to see us leave, held us for days at Kayenta because a weary sun was too tired with constant drying out of mudholes.

Those transcontinental motorists who have waited dejectedly in a



Photograph by Edwin L. Wisherd

AN INDIAN "POTATO RACE" AT GALLUP'S ANNUAL CEREMONIAL

The winner is he who first carries a given number of potatoes, one at a time, a measured distance and deposits them in a pail at the goal.

wide adobe flat for help to come through the miles of mud have seen the Southwest at its wettest. There, summer showers are almost tropical in their intensity. They fill arroyo banks and undermine bridges while you wait. They loosen boulders, throw down trees, and start landslides; they add to the work and worry of riders.

But most trail accidents, if no serious injury is involved, sooner or later disclose humorous possibilities. The personal discomfort of one's saddle companions is always fit subject for jest. And during the rainy season, especially, opportunity knocks frequently.

Sodden biscuits are filling, if unpalatable; salted coffee can be drunk. To watch cold, clubby fingers build a fire with soggy wood is indeed amusing. But the very acme of trail humor follows when a tired rider reaches camp at nightfall to discover that his bed tarp has not protected his blankets from a penetrating shower. One can forgive human frailties and omissions, but when the gods take sides the joke is too good to disregard utterly.

There is the case of little Mac—flat-faced, lop-eared Macduff—slowest and most obstinate of all our pack-mules. We were climbing the south wall of the San Juan and our clothes were still drenched from the rescue of Bino; the trail was wet and steep and a bit tricky. In trying to make one particularly high jump, Mac struck the corner of his pack, fell backward, and rolled over. Stub caught him on the very edge of the precipice and sat on his head, while George climbed atop the prostrate mule to loose the lash rope.

Now there was nothing ludicrous about Mac's predicament at the moment; his hind feet were thrust out into empty air a good fifty feet above a jagged rocky talus. He was safe if one stubby cowpuncher could hold down his head and prevent his struggles while the bulky pack was removed and those dangling hind feet pulled back on to the trail.

No one was present to point a camera; all hands stretched to help the stubborn mule with the Scotch name. But afterward, on the easy mesa trail, when the strain of the rescue had vanished, much sport was made of Mac's narrow escape, of Stub sitting complacently on the mule's head, of George scrambling over the wet, muddy pack, tugging at the rain-stiffened ropes.

Two days later we stood beneath the graceful arch of the colossal Rainbow Natural Bridge (see pages 298 and 299), marveling at the stupendous folly of Nature, who builds temples to herself and then, in changeful mood, tears them down again. Low-hanging clouds bowled across the gorge to reveal, for seconds only, the glistening snow-covered summit of Navajo Mountain. Chill winds rushed down the canyon to cry and moan in the creviced red walls.

AT THE RAINBOW BRIDGE FOURTEEN YEARS AFTER ITS DISCOVERY

Fourteen years before I had first seen this sublime creation of the Master Builder. Following Professor Cummings, urged on and encouraged by John Wetherill after our Indian guides sought to quit their wearisome task, we had come, the first white men to gaze on the great Na-gee-lid Non-ne-zo-shi—the Rainbow-Turned-to-Stone. Those early memories, those initial impressions, still baffle description.

The trail of to-day is much easier than the one we built; its more dangerous portions have been smoothed out or avoided. Three hundred individuals, including the late ex-President Roosevelt and a score of travelers from abroad, have followed in the footsteps of the discoverer and few have returned disappointed. Not all of these strangers came with reverence in their hearts. One, for instance, seems to have had as his chief object in visiting Non-ne-zo-shi the opportunity to be able to tell his grandchildren that he was the first civilized man to drive a golf ball over the stately arch.

And so it was very gratifying to note, after these many years, that the Rainbow Bridge, alone among the natural wonders of our country, remains pretty much as the desert gods made it.

Majestic in its solitary retreat, yet dwarfed by the massive cliffs that tower above it, the stone rainbow is still the mystic bridge over which the true sons of Earth may escape their mortal sorrows. As a rule, the desert makes brother worshipers of all who venture into its secret places to share its hidden mysteries.

AMONG THE "CRATERS OF THE MOON"

An Account of the First Expeditions Through the Remarkable Volcanic Lava Beds of Southern Idaho

By R. W. Limbert

With Illustrations from Photographs by the Author

IN THE West the term "Lava Beds of Idaho" has always signified a region to be shunned by even the most venturesome travelers—a land supposedly barren of vegetation, destitute of water, devoid of animal life, and lacking in scenic interest.

In reality the region has slight resemblance to its imagined aspect. Its vegetation is mostly hidden in pockets, but when found consists of pines, cedars, junipers, and sagebrush; its water is hidden deep in tanks or holes at the bottom of large "blow-outs" and is found only by following old Indian or mountain sheep trails or by watching the flight of birds as they drop into these places to quench their thirst. The animal life consists principally of migrant birds, rock rabbits, woodchucks, black and grizzly bears; its scenery is impressive in its grandeur.

A glance at a map of Idaho shows that the southern part of the State, lying between Arco and Carey and north of Minidoka, is a vast region labeled desert or rolling plateau.

Although almost totally unknown at present, this section is destined some day to attract tourists from all America, for its lava flows are as interesting as those of Vesuvius, Mauna Loa, or Kilauea.

The district consists of some 63 volcanic craters, lava, and cinder cones, all at present extinct or dormant. The largest and most conspicuous is 600 feet high, rising in the midst of a belt of craters two or three miles wide and 30 miles long. The craters or cones are close together in the north and west; in the south they are miles apart.

That a region of such size and scenic peculiarity, in the heart of the great Northwest, could have remained practically unknown and unexplored is extraordinary.

For several years I had listened to stories told by fur trappers of the strange things they had seen while ranging in this region. Some of these accounts seemed beyond belief.

I had made two trips into the northern end, covering practically the same region as that traversed by a Geological Survey party in 1901. My first was a hiking and camping trip with Ad Santel (the wrestler), Dr. Dresser, and Albert Jones; the second was with Wes Watson and Era Martin (ranchers living about four miles from the northern edge). The peculiar features seen on those trips led me to take a third across the region in the hope that even more interesting phenomena might be encountered.

EXPLORING AN UNKNOWN REGION IN THE UNITED STATES

One morning in May W. L. Cole and I, both of Boise, Idaho, left Minidoka, packing on our backs bedding, an aluminum cook outfit, a 5 x 7 camera and tripod, binoculars, and supplies, sufficient for two weeks, making a total pack each of 55 pounds.

We also took with us an Airedale terrier for a camp dog. This was a mistake, for after three days' travel his feet were worn raw and bleeding. In some places it was necessary to carry him or sit and wait while he picked his way across.

North of Minidoka, for about 25 miles, we crossed a rolling lava plateau, after which came comparatively later flows of lava. So far as can be learned by diligent inquiry, we were the first white persons to cross this plateau from south to north (see map, page 306).

For three days our travel was over the

XUM

TAKING HORSES TO WATER DOWN A CINDER RIDGE

The cinder cones, or buttes, of southern Idaho are extinct volcanoes of recent date, and of remarkably fresh appearance. They are composed, to a great extent, of dust, volcanic sand, and gravel (called lapilli), thin, cakelike forms of lava, volcanic bombs, and rough, ball-like masses, known as scoria. The prevailing colors are red and brown.

uninteresting, broken-up lava surface known as AA flow (a term derived from the Hawaiian natives, who apply it to a similar surface found in their islands). It was the hardest going imaginable, each rock seeming on a balance and ready to turn the instant it was trod upon.

Our water on this part of the trip was snow and ice which we found in crevices.

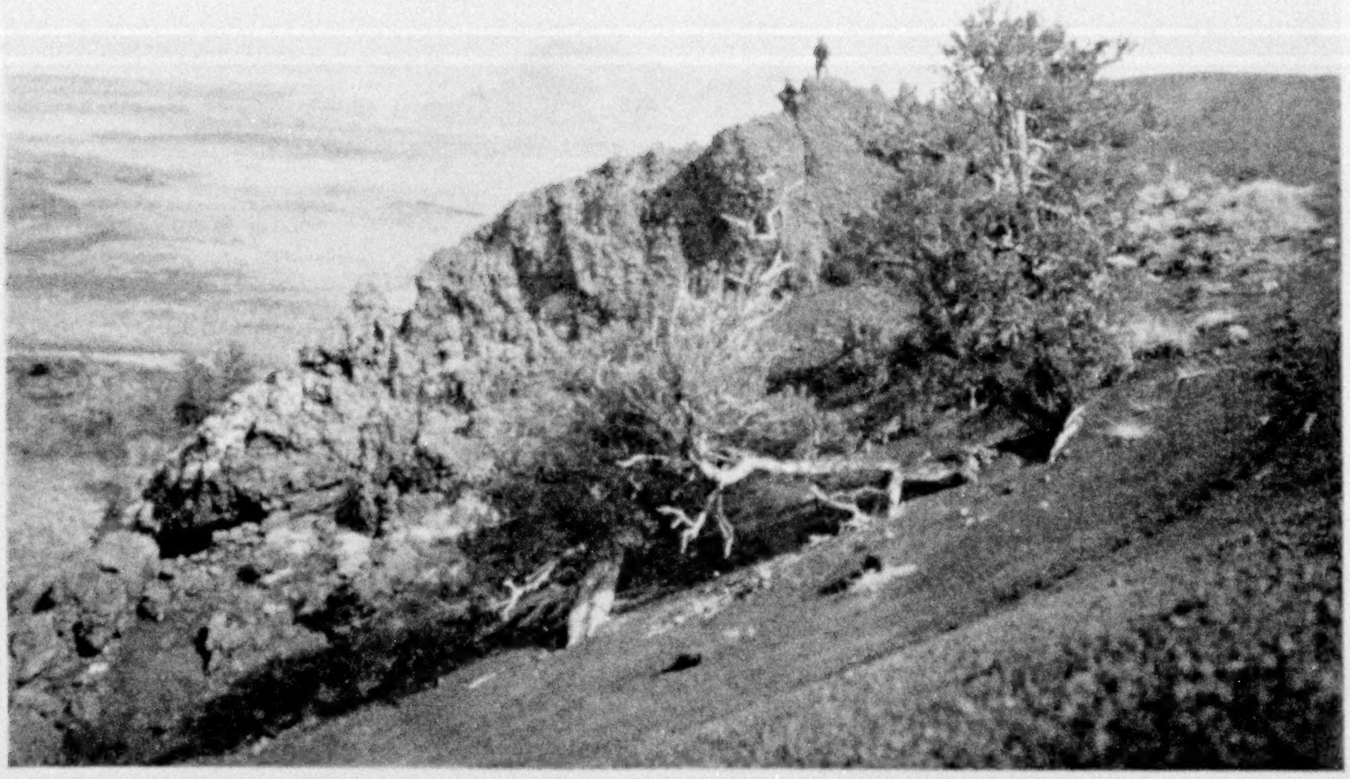
WATER FLAVORED WITH WRIGGLERS

The fourth day out we sighted an Indian monument in an open flat, and 20 feet from it we found a hole about two feet in diameter, that opened downward like an immense cistern. This was full of clear water. About 10 feet to the west of this was a lava crack, down which we could see some 15 feet before it angled off.

After drinking our fill, we made the discovery that the water was full of innumerable little bright red wrigglers that looked like small shrimp. Each was about three-sixteenths of an inch long. However, the water was good and one cannot afford to be squeamish in desert country.

We located this water hole by compass bearings on Red Top Butte and Sugar Loaf Butte, noted on the map (see page 306). It is the only water in this vicinity which can be depended upon the year round.

The lower slopes of Sugar Loaf were covered with wild onions, which were crushed as we walked and gave out an odor more pleasant to tell about than to experience.

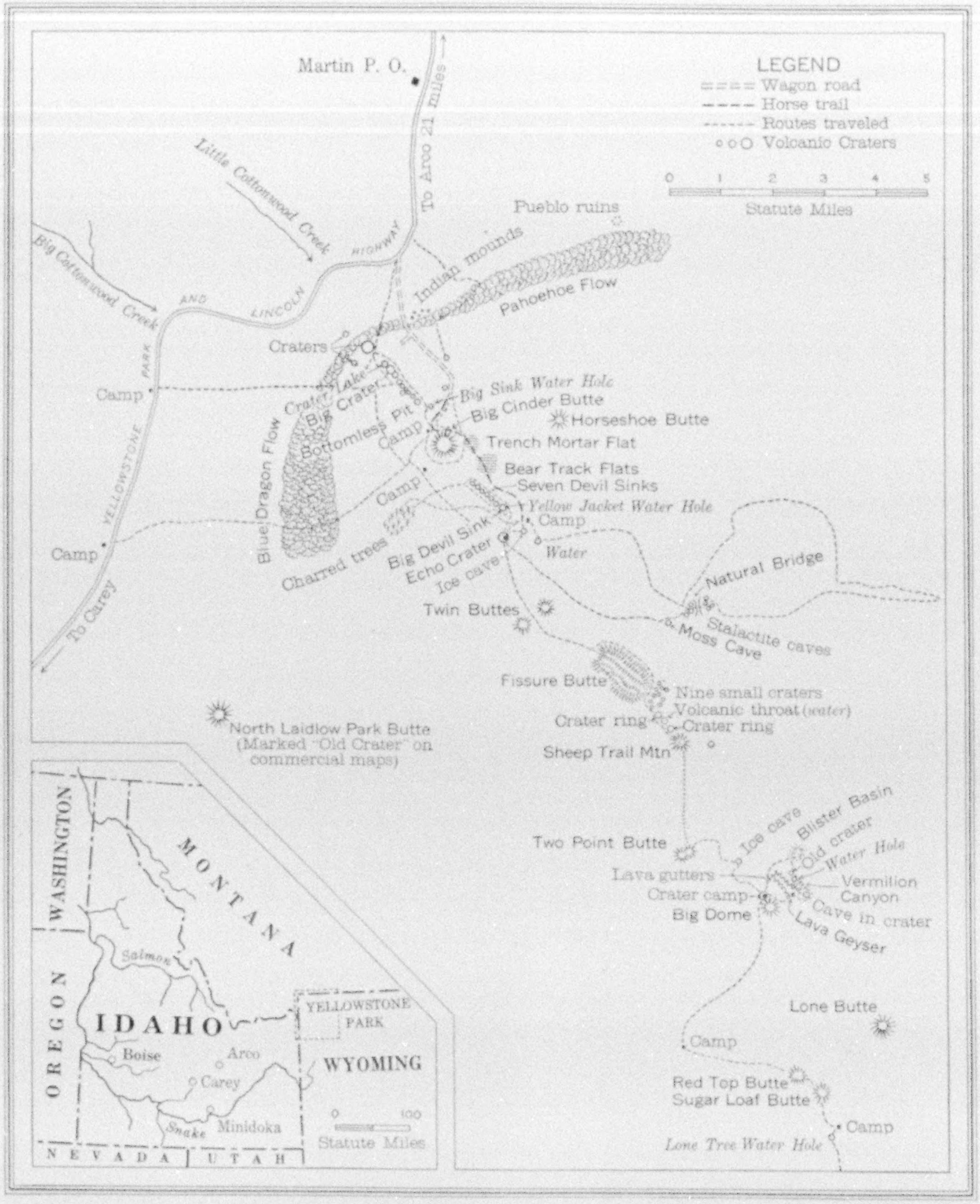


LOOKING SOUTH FROM A RED-RIMMED CRATER

The vegetation of this region includes, besides sagebrush, a few species of pines and junipers, the pear-leaf cactus, and such flowers as larkspurs, wild violets, and daisies. The later lava flows, however, are barren—not even a blade of grass has been able to take root on some of them.

AROUND THE CAMP FIRE

At night, in the weird reflections of a camp fire, the surrounding sides of this crater appeared like a gigantic funnel with flickering colors of red and black. Its floor acted as a sounding board for the notes of birds migrating northward far overhead.


LEGEND
Wagon road
Horse trail
Routes traveled
Volcanic Craters
0 1 2 3 4 5
Statute Miles
Martin P. O.
To Arco 21 miles
Little Cottonwood Creek
Big Cottonwood Creek
LINCOLN HIGHWAY
YELLOWSTONE PARK AND
To Carey
Pueblo ruins
Indian mounds
Pahoehoe Flow
Craters
Camp
Crater Lake
Big Crater
Bottomless Pit
Blue Dragon Flow
Big Sink Water Hole
Big Cinder Butte
Horseshoe Butte
Trench Mortar Flat
Bear Track Flats
Seven Devil Sinks
Yellow Jacket Water Hole
Camp
Charred trees
Big Devil Sink
Echo Crater
Ice cave
Water
Twin Buttes
Natural Bridge
Stalactite caves
Moss Cave
Fissure Butte
Nine small craters
Volcanic throat (water)
Crater ring
Crater ring
Sheep Trail Mtn
North Laidlow Park Butte (Marked "Old Crater" on commercial maps)
Two Point Butte
Ice cave
Blister Basin
Old crater
Water Hole
Lava gutters
Vermilion Canyon
Crater camp
Big Dome
Cave in crater
Lava Geyser
Lone Butte
Camp
Red Top Butte
Sugar Loaf Butte
Camp
Lone Tree Water Hole
WASHINGTON
MONTANA
OREGON
IDAHO
Salmon
Boise
Arco
Carey
Snake
Minidoka
YELLOWSTONE PARK
WYOMING
0 100
Statute Miles
NEVADA
UTAH

Drawn by A. H. Bumstead

A MAP OF THE "CRATERS OF THE MOON" IN IDAHO

The dotted lines indicate the routes taken by the author on his several expeditions through this unique volcanic region.

Along the slopes there were evidences that bears had been digging for roots and rolling rocks for ants.

From the top of Sugar Loaf we picked up an old Indian trail which resembled a light streak winding through the lava. When the sun was directly overhead it could be seen to advantage, but at other times was difficult to follow. Think of the years of travel necessary to make that mark on rock!

Some miles to the north was the butte called Big Dome, and a few hundred yards north of it a crater several hundred yards in diameter and about 200 feet deep.

We camped in the bottom of this crater

EXAMINING A SMALL CRATER IN VERMILION CANYON

The lava field of the Snake River plains of Idaho is larger than any other in North America, so far as is known, except that of the Columbia River. One writer, summing up his general impression of the Snake River lava desert, says: "It was as if the great plain had been filled with molten rock which had kept its level and wound in and out along the bays and promontories of the mountain slopes as a sheet of water would have done." The Craters of the Moon district occupies about 300 square miles of the total 27,000 square miles of the Snake River field.

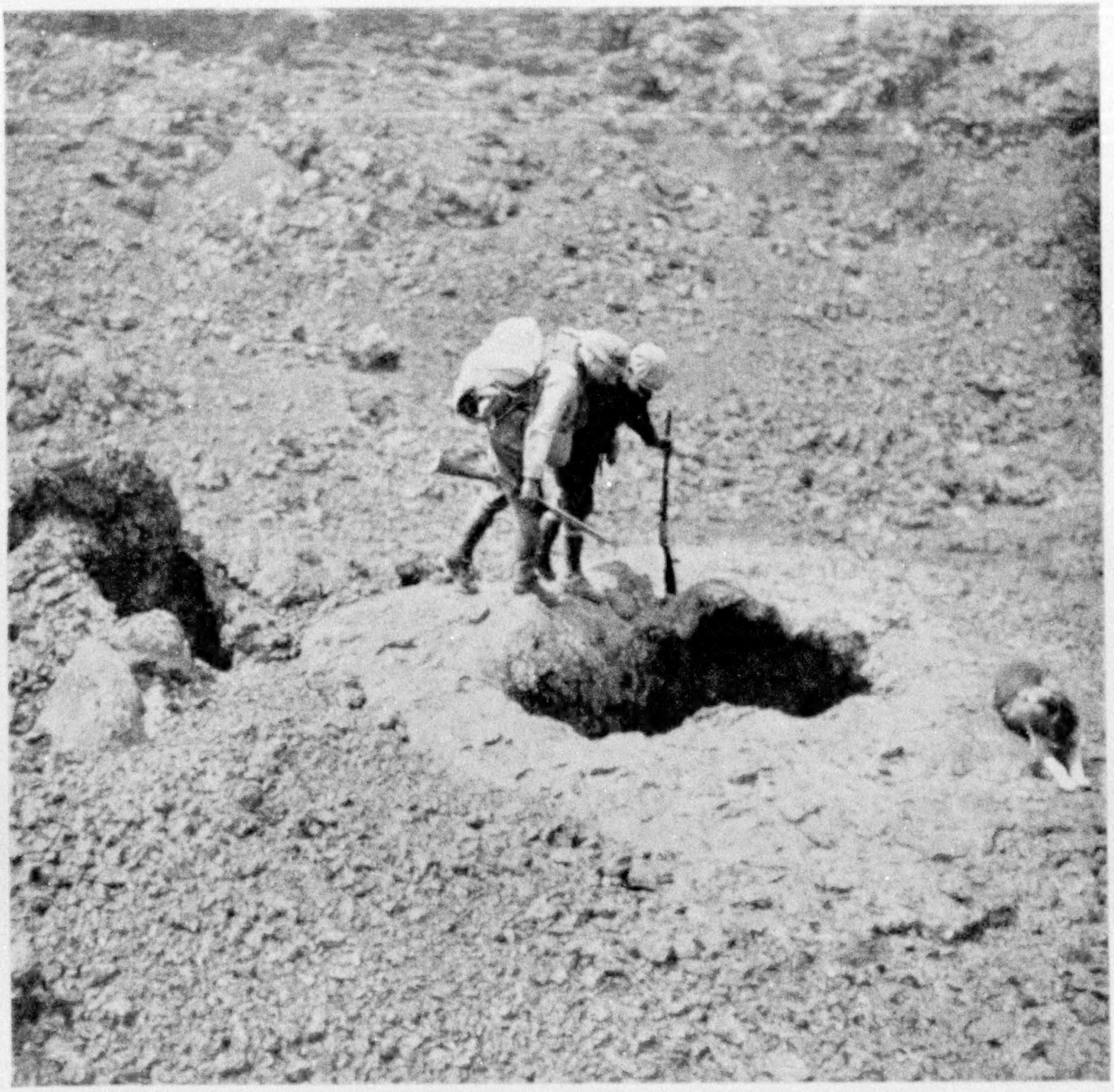
that night, and the experience was well worth the climb up and down. Imagine yourself in some gigantic funnel of bright red and black, weird in its reflections of the camp fire, with the stars above. A peculiar feature of the bottoms of the craters was that they seemed to act as sounding boards for the notes of the birds migrating northward far overhead. Their faint calls were gathered and intensified until the birds seemed only a few feet away. Near here we built a signal fire that was seen by people watching for it 30 miles distant (see page 305).

MAGNETIC CRAGS MAKE COMPASS USELESS

Half a mile east of Big Dome we found an immense crater ring that looked as if the top of a mountain had collapsed and fallen back into the volcanic throat. From the center crags of bright-red lava and burnt cinders jutted up. In some places the lava was black, as if smoked in a fire.

The crags had magnetic properties, and the compass needle could not be depended upon when near them. About a quarter mile to the northwest was a large fissure, which we called Vermilion Canyon. The floor, a hundred or more feet in width, was composed mostly of cinders; the walls of lava were a bright, almost a vermilion, red in the sunlight. Near the center were several extinct lava spouts, one of which was 25 feet in diameter and built up so that it resembled the geyser formations of Yellowstone Park. In the center of it was the throat, about 5 feet wide and 18 feet deep. The sides had fallen in and choked it up.

Fifteen feet south of this was a hollow cone, built up 4 or 5 feet. One side had fallen in, exposing the throat, which went down 25 feet and then angled off, we could not tell how far. Fifty feet to the north was another cone, about 4 feet high and 2½ feet in diameter at the base. This had a 6-inch hole in one side, which



INVESTIGATING A LAVA SPOUT IN VERMILION CANYON

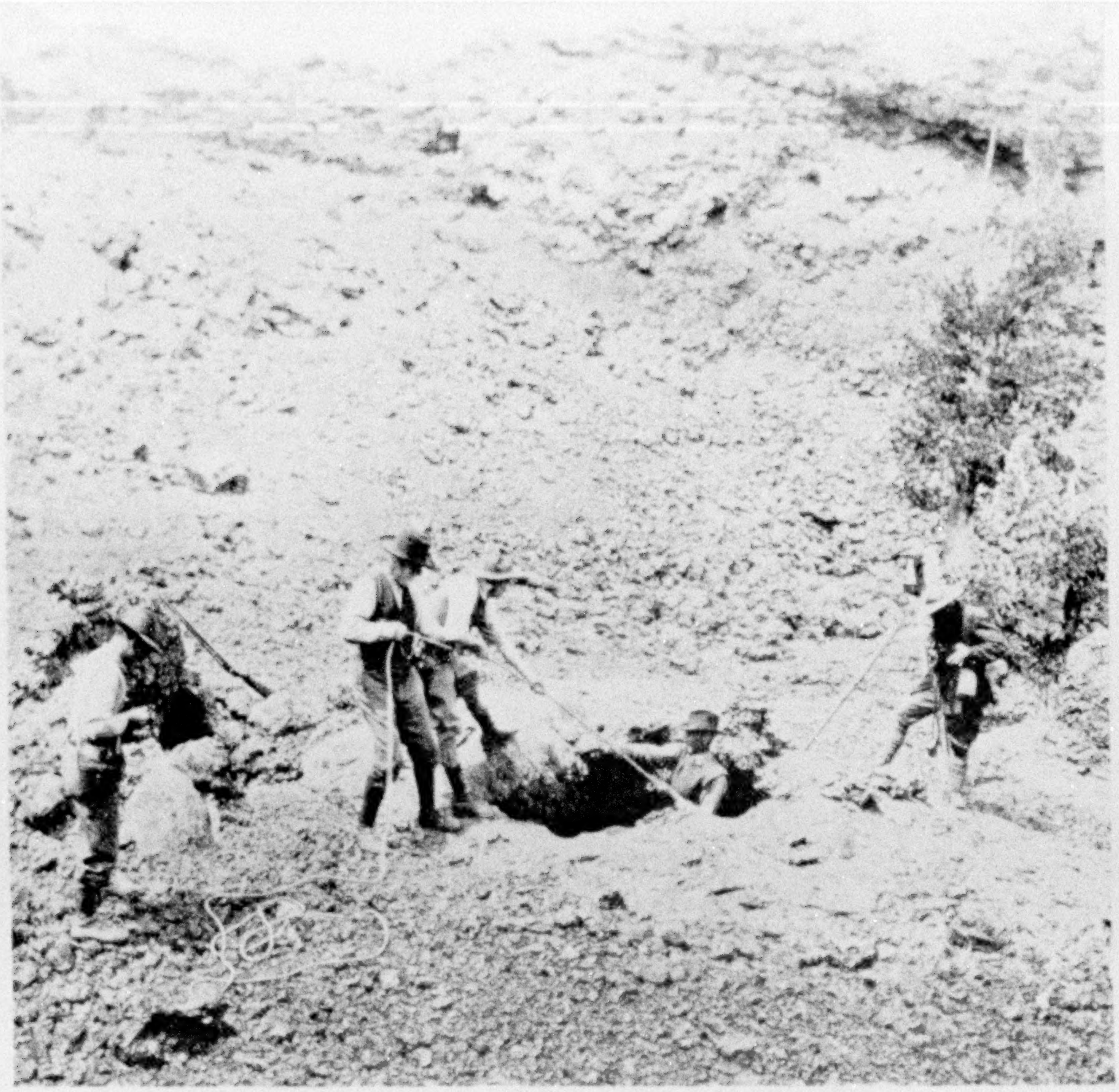
The bird and animal life of this fantastic region includes sparrow hawks, mourning doves, rock conies, rabbits, chipmunks, mice, kangaroo rats, and other species. Rattlesnakes, however, are absent, although they abound on the edges of the flows. It is probable that the snakes were killed off at the time of the eruption, and that they have as yet been unable to cross the immense lava barrier.

opened up as it went down—how deep we could not gauge, as it had drifted full of snow.

Near here we saw a pile of rocks with a piece of charred sagebrush in it pointing to another water hole that probably contains water during the summer. Working our way through the fissure for a quarter of a mile, we found it opened upon a flat, and about 600 yards to the north was another crater similar to the one just passed. As we sat on the east side of its rim, we saw below us a hundred or more large lava blisters or bubbles. In many instances the tops had fallen in, disclosing rooms from 8 to 10 feet across and as high as 6 or 7 feet. The shells of these lava bubbles were from 6 to 8 inches thick. Their color was a grayish brown.

DISTANCES WERE DECEPTIVE

At all places of interest I set up the compass and triangulated on the more prominent buttes shown on the accompanying map (see page 306). Sometimes it was necessary to move the location several hundred feet, as the needle was attracted to the rocky points. In one spot the north end of the needle swung



COMING OUT OF A LAVA SPOUT, VERMILION CANYON

This canyon has a cinder floor over 100 feet in width and lava walls of a vermilion color in the sunlight. Near the center the expedition found extinct lava spouts, one of which resembled the famous geyser formations in Yellowstone Park.

completely around and pointed within 7 degrees of due south.

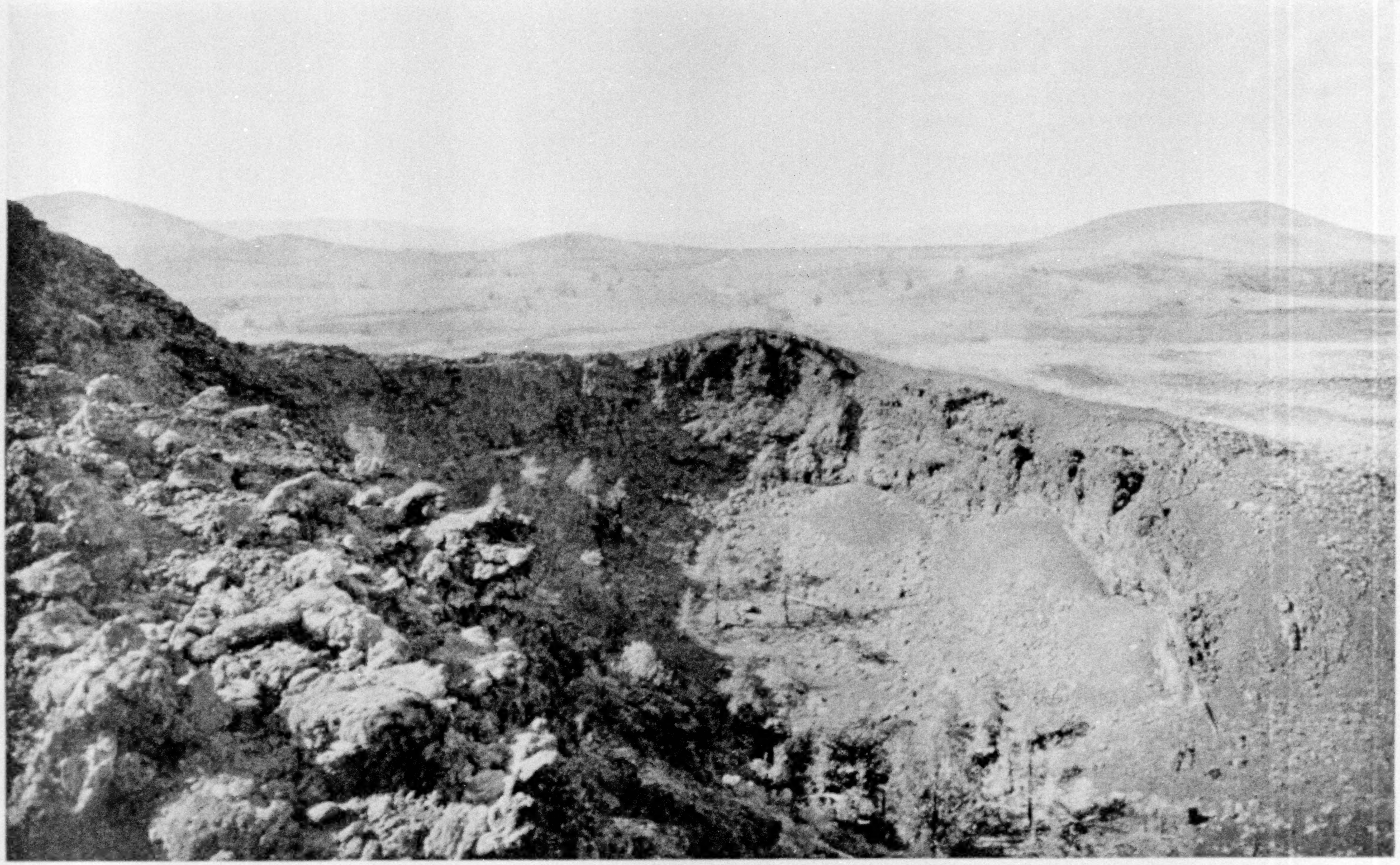
Estimating distance was also very difficult, owing to the lack of any object of known size to use as a scale. We usually found that distances between specific points were about half again as far in an air line as we estimated.

West of the crater beside Bubble Basin we saw channels winding through the lava flat just as meandering brooks might cross a level meadow. Examination showed these to be lava gutters. Here the plastic lava had flowed down grade, assuming all the shapes of a mountain stream. It was in waves, rolls, twists, and levels.

As we stood on the edge and looked down, we tried to imagine the wonderful sight when the whole lava bed was glowing red.

A CAVE COVERED WITH CRYSTAL ICE

Traveling northwest for a mile, we came to another Indian marker—a pile of rocks. It had a smaller pile at the base and, in a line with it, about 20 feet distant, at the base of a cliff, was the entrance to a cave that opened up into a room 18 feet wide by 12 feet high. From the ceiling hung clusters of immense ice stalactites, sometimes touching a few stalagmites of the same material below. The floor was covered with ice so clear



LOOKING ACROSS ECHO CRATER

This vividly colored crater is 700 feet deep and about one-fourth of a mile wide. The eastern side has breached away until it is only 100 feet high. Viewed from the center, the crater shows the effects of two explosions, the first of which formed the crater, the second blowing a hole in the bottom. A ridge on the southern end is pitted with 14 smaller craters, 9 of which are of the blow-out, or explosive, type. Echo Crater is one of the few in the district having trees on the inside (see text, page 312).

that when I first reached it I dipped down for a drink.

Lighting our single candle, we worked our way for about 50 yards, until the passage narrowed down to about 2 feet in width and 1½ feet in height. After about 10 feet of this, it opened again into a drop-off that blocked our farther progress.

When leaving we restored the old Indian marker, which had partly fallen down.

CRATERS BANDED WITH GREEN AND YELLOW

North of this point we found a high cinder cone whose sides were terraced with old mountain sheep trails. They stood out so prominently from a distance that we called it Sheep Trail Mount. In climbing to its top to triangulate our position, we found it had a double crater, or rather a crater within a crater, evidently caused by two heavy explosions at different times.

The sides of the crater were banded with rings of green and yellow. This was the only sulphur deposit found on the trip.

On the very top of the cone we noticed fresh bear signs, where a grizzly had sat for some time looking at the land below.

About 200 yards to the north was another large crater, 300 yards wide and 150 or 200 feet deep. For three-fourths of its circumference the sides were perpendicular, the balance being a cinder and ash slope.

About 100 yards northwest of the north rim of this crater we found a blow-out cone, with a throat about 10 feet wide and 15 feet long, that went down 30 feet and branched off.

While Mr. Cole was adjusting the straps of his pack, I noticed a narrow crack in the side of the throat and climbed down. The snow had drifted into the passage 15 or 20 feet. The north wall had a sort of lava oven about 10 feet high and hollow, which resembled an inverted wasp nest, the sides being about 8 inches thick.

Fifteen feet north of the oven was the rim of another crater blow-out, 100 feet across and 150 feet deep. Fifty yards from the edge of this were nine small blow-out craters.

Were I gifted with the art of word painting, I might in some small way suggest the wonderful coloring of these craters. Picture yourself standing in some vast amphitheater whose towering walls are a riot of yellow, green, orange, brown, and black, with brick red and vermilion predominating. Imagine, too, an awesome, enveloping silence. I noticed that at places like these we had almost nothing to say. It was little wonder the Indians feared and shunned the region.

After leaving this scene, our trail lay along a series of cinder cones for about seven miles, each with a depression in its top. Examination from a distance with the binoculars showed no unusual features worth the climb, and when one is carrying a pack weighing 55 pounds over this kind of country one does not climb for the mere pleasure of it. As our food supply decreased, we increased our load with oddly formed pieces of lava rock, and the last day found our pack nearly as heavy as when we started.

A PRISONER IN A CRATER

The night we reached the point marked Echo Crater on the map, Cole's feet had become so badly blistered that the pain of walking was almost unendurable. The dog was in terrible shape also; it was pitiful to watch him, as he hobbled after us.

We planned to camp for several days, while I worked out alone. When morning came the tendons in one of Cole's feet had swollen and were so stiff he could not bend it. It was then decided that he should stay in camp and bathe his foot while I tried to reach Era Martin and Wes Watson, who were waiting to come back with us from the north end. That day I made the round trip of 28 miles, getting back at dark. I carried only a gun, camera, and canteen.

It was on this trip that I had rather an odd experience. In passing through a pahoehoe flow (a word also borrowed from the Hawaiians and used to distinguish a smooth, ropy flow from the rough, broken-up, ice-jam formation of the AA flow), I noticed a hole, 15 feet wide and 10 feet deep, evidently caused by the cave-in of the roof of some underground passage.

Happening to look down, I saw a mountain sheep's skeleton with the horns

FILLING CANTEENS AT BIG SINK WATER HOLE

The water supply of this region is hidden in tanks or holes at the bottom of blow-outs, and can be found only by following old Indian trails and mountain sheep paths, or by watching birds as they make sudden drops into these hiding places. The water is usually cold and free from algæ.

in a good state of preservation. Carelessly I laid aside my gun, camera, and canteen and jumped down, alighting on some wind-blown cinders which happened to be at one end. After looking the horns over, I started to climb out, and found that the farthest I could reach lacked about four feet of the top. To be frank, I had some very queer thoughts, chief of which was, Will anybody ever find me or shall I, like the sheep, lie here for years?

Sitting on one of the rocks that littered the floor, I rested and thought. After a time, by rolling and lifting some of these rocks into a pile at one end, I had a mound from which I could easily reach the rim and draw myself up.

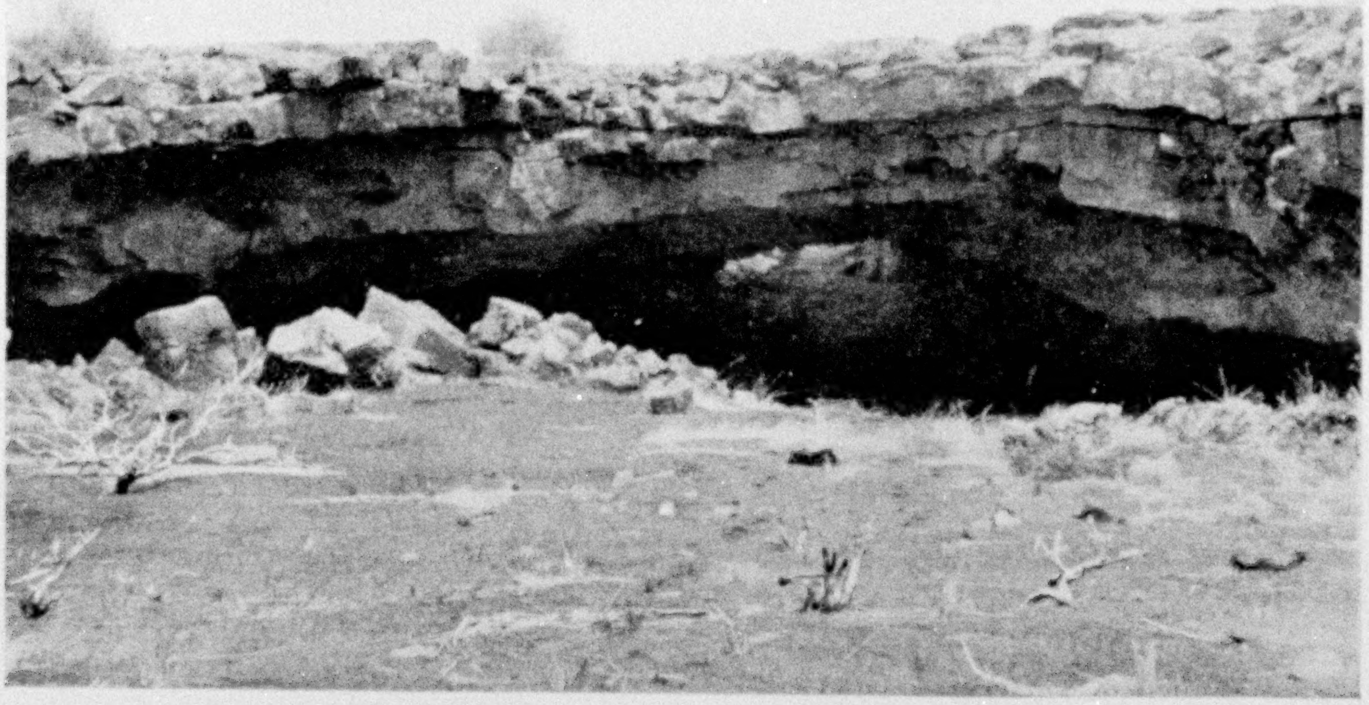
Echo Crater, as we called it, is one of the most beautiful in this region. It is 700 feet deep and is one of the few craters having a growth of timber on its sides and bottom. The dark green of the pines and cedars emphasized the vivid coloring common to all these craters. It was an ideal camping place, our camp being in the shade of the west wall after 2.30 p. m.

The acoustic properties of the site were most unusual. One morning, just at daylight, I was awakened by the loud calls of a bird. I lay trying to place it, and finally got up to locate the source, and found a robin singing in one of the pines at the foot of the west wall. We afterward took turns in singing and yodeling from that side to hear the echoes break the voices up and fade away. The east side produced no echo.

AN ICE CAVE OF UNUSUAL BEAUTY

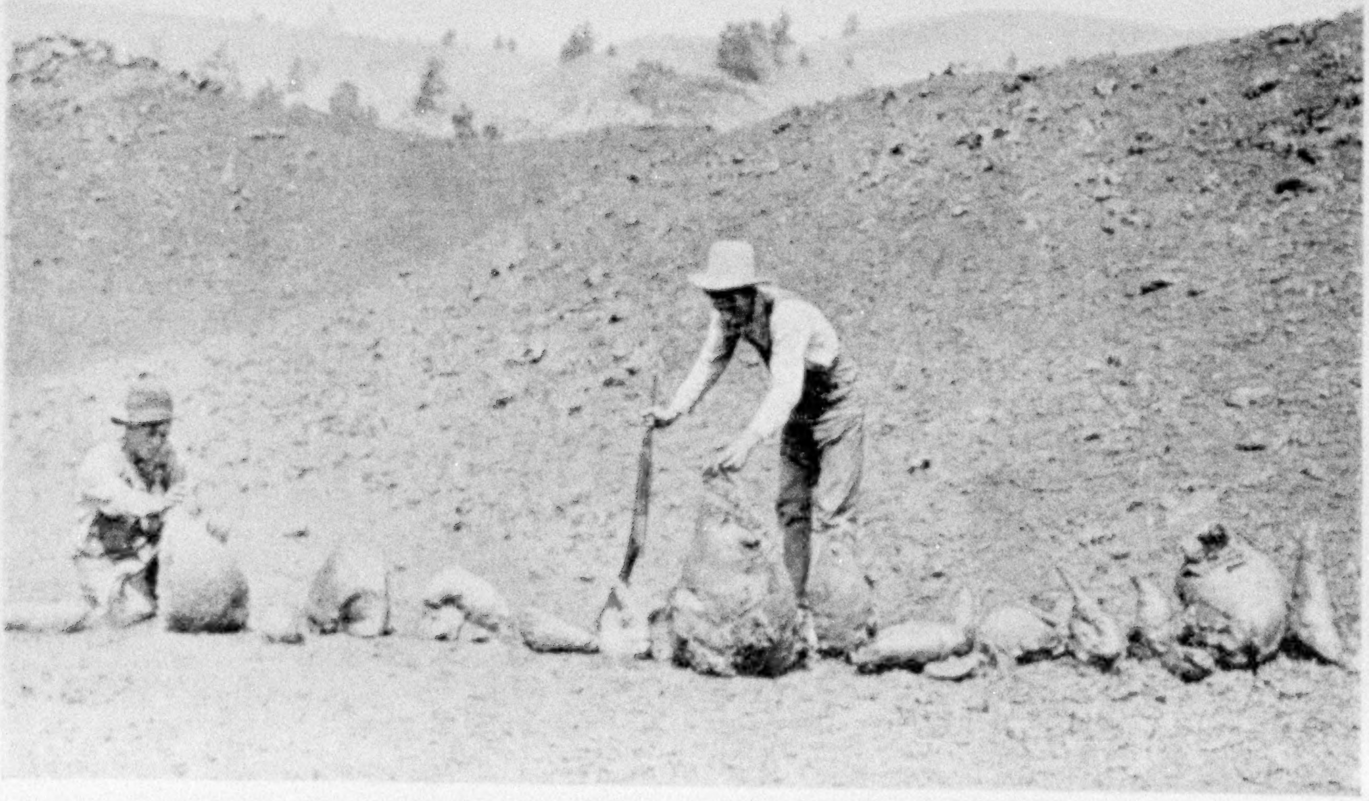
About a quarter of a mile east of Echo Crater is the ice cave discovered on the trip of the year before. Happening to look down in one of the numerous sinks with which this region abounds, I saw a black opening which had the appearance of a cave. Climbing down one side of the pit, which was 100 feet long and 30 feet deep, we were surprised at the rush of cold air from the entrance.

The cause was immediately apparent. It was an ice cave and one of the finest examples, I believe, in existence. The floor was a conglomerate mass of huge



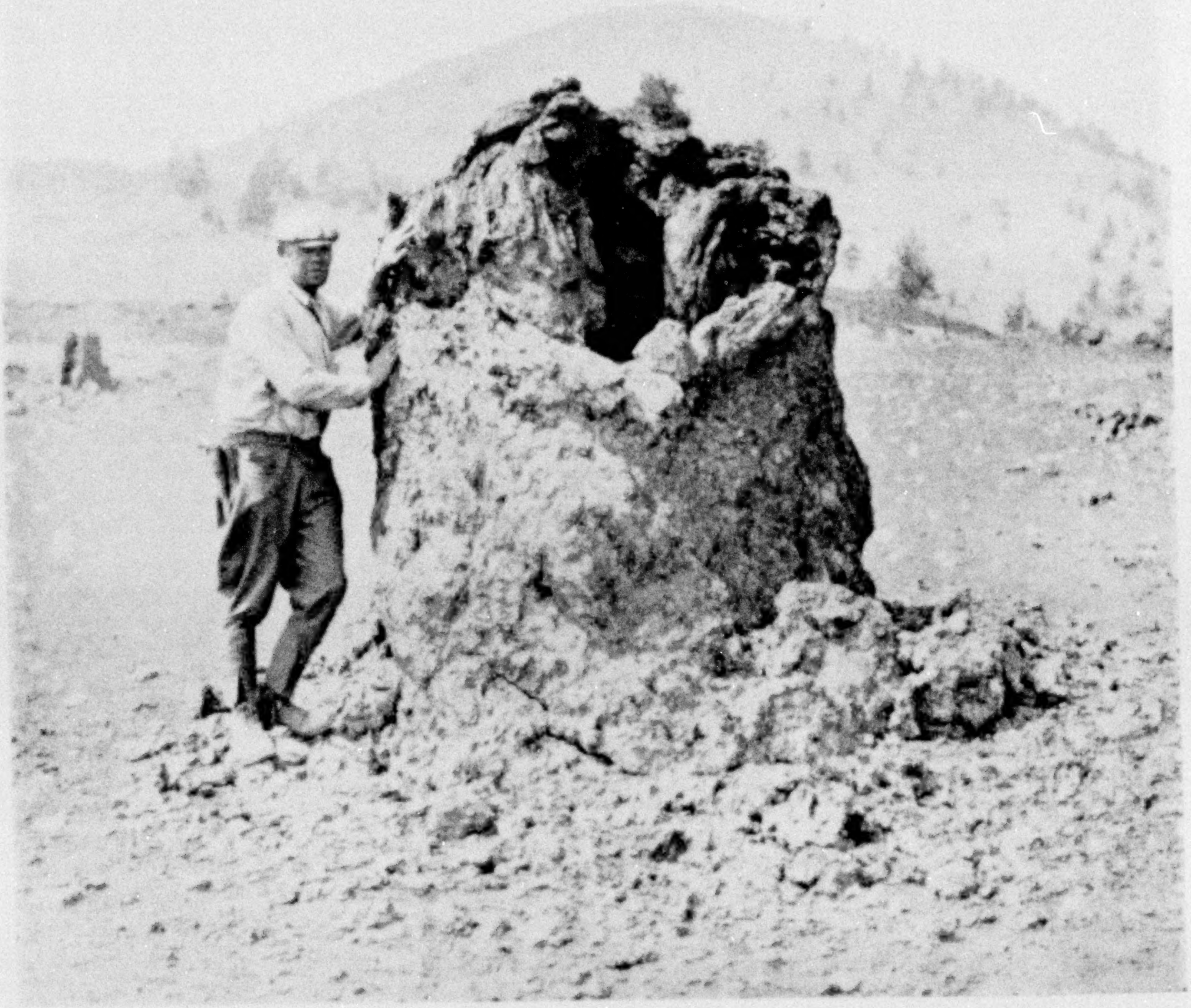
"THE BRIDGE OF TEARS"

This natural bridge of solid lava doubtless covered an underground cavern at one time. It has a 50-foot span, and the height from floor to roof of arch is more than 15 feet. West of this bridge is a cave, where the author discovered fresh bear tracks, but no live animals were seen.



EXAMINING VOLCANIC BOMBS

Most of the lava bombs on Big Cinder Butte resemble footballs, with projections, or "ears," at each end. Some are compact throughout; others have an outer crust, sometimes an inch thick, of black basalt. The shape assumed by the liquid lava before cooling depended upon the length of time it was in the air and on the manner in which it rotated.



A SPATTER CONE ON TRENCH MORTAR FLAT

Many of these blowholes, or fumaroles, have perpendicular throats from four to twenty inches wide, and are twisted or rifled like gun barrels. Most of the hundred or more cones on this flat have been plugged with small stones, probably by Indians.

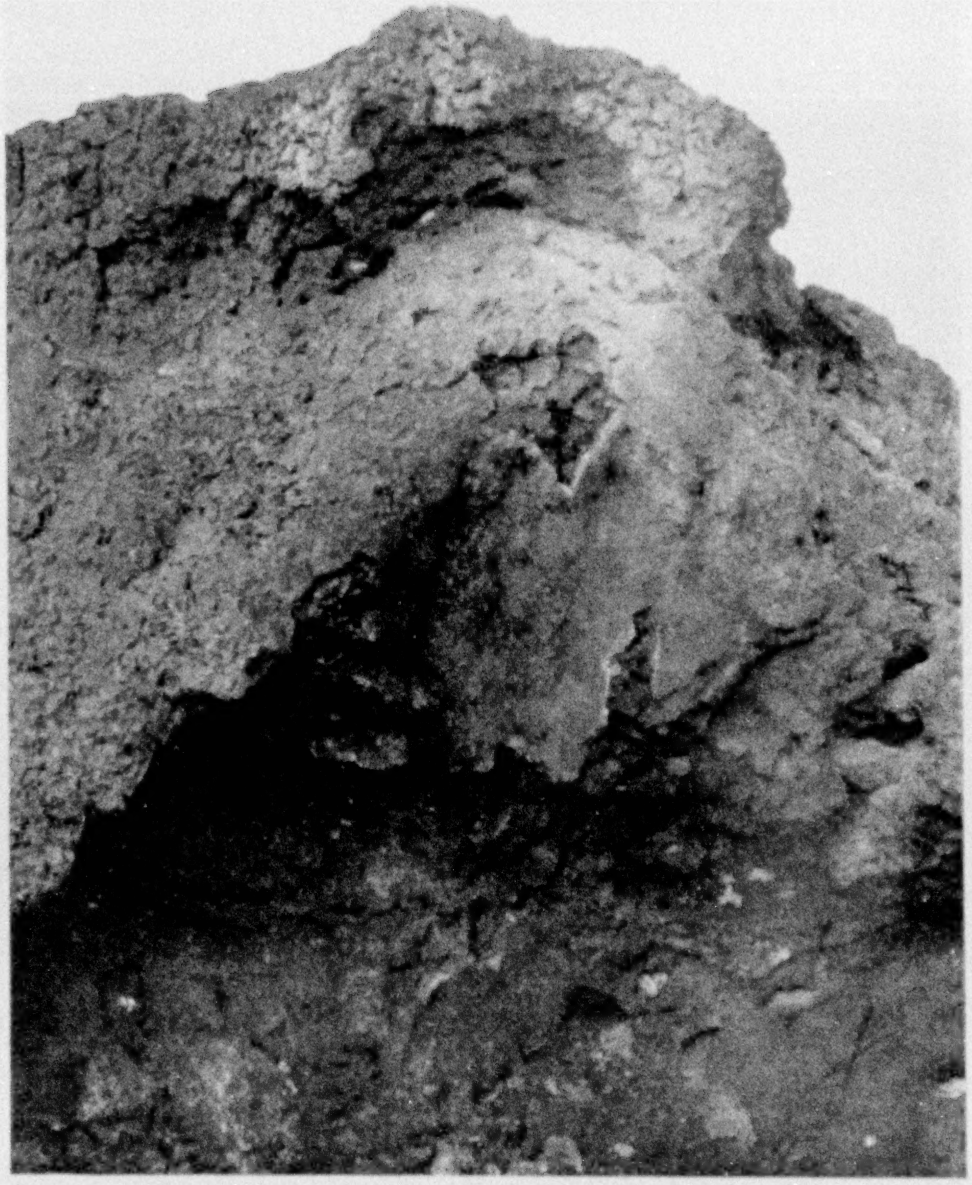
lava blocks. These and the walls were incrusted with about two inches of ice as clear as glass, through which the structure of the rock could easily be seen.

We struck matches and were surprised to see hanging from the ceiling many ice stalactites, some 4 to 8 inches in diameter at the base and from 3 to 8 feet long. In places, especially where there was a ridge in the ceiling, they were in closely packed clusters. In spots I noticed ice stalagmites building up to meet the stalactites from above.

Forty-five feet from the entrance the tunnel narrowed and inclined downward at an angle of 15 degrees. Breaking off the tips of some of the icicles, I threw them down and could hear them skidding and sliding on the ice for some distance. It was not advisable to venture out on this ice incline, for a slip might have projected us we knew not where.

During the month of August, on a subsequent trip into this region, I visited the cave and found it full of ice on the bottom, but without the icicles or incrustations on the wall. At the south end of the pit we noted another cave, which had about three feet of water over the stratum of ice. This went off into still another cave of unguessed dimensions.

At this point my curiosity was aroused by the number of mourning doves flying about. Knowing their habits, I wondered at their appearance in a region lacking water. I followed their course with the binoculars, just as a bee hunter would line bees to a bee tree, and was surprised to see them drop down into a blow-out. Following them, we came upon a pool of water five feet in diameter.



A VOLCANIC CRATER SHOWING ITS COATING OF LAVA PAINT

The deep-blue film on the surface of some of the lava flows is a "desert varnish," which is due to the evaporation of water drawn from within the lava. This process has brought about a chemical precipitation of some of the material leached out of the lava.

It was an extremely hot afternoon, in the middle of August, and the heat on the sides of the blow-out was terrific. The rocky slopes burned the hand. We were wet with perspiration as we reached the bottom. Dipping up a cupful of water, we were astonished to find it icy cold—so cold, in fact, that it hurt our teeth, and we put the cup down on the hot rocks to warm. This phenomenon can only be accounted for by the supposition that it was seepage water from an ice cave.

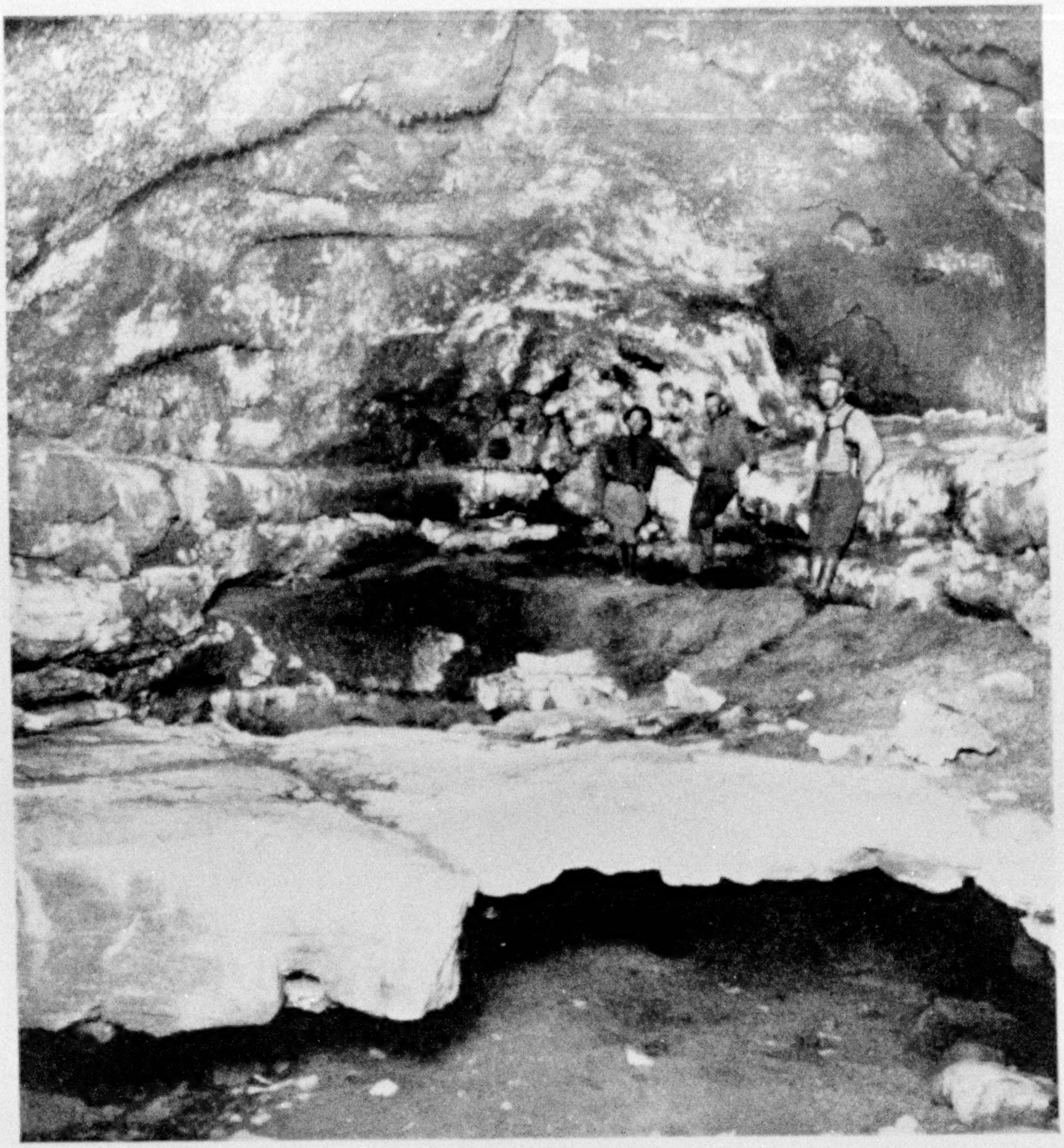
By lining flights of doves, four other water holes were located, all as cold as the first. One was covered with an inch coat of drowned hornets that had been chilled and had fallen in. The water underneath was pure and sweet. We named this Yellow Jacket Water Hole.

On the north rim of the big sink or cave-in containing Yellow Jacket and about 50 feet from the edge are the remains of a perfect lava geyser built up 5 feet, with a spiral hole in the top which forks at a depth of 15 feet.

The sink itself is about 400 yards wide and 150 feet deep. We named it the Big Devil. Just to the north of it is a series of six smaller sinks or blow-outs. We called the row the Seven Devils. One of these also has a water hole.

LOST IN A FOG

The morning after we had explored this section there was a fog so thick that a person could see but 150 feet in any



THE INTERIOR OF AMPHITHEATER CAVE

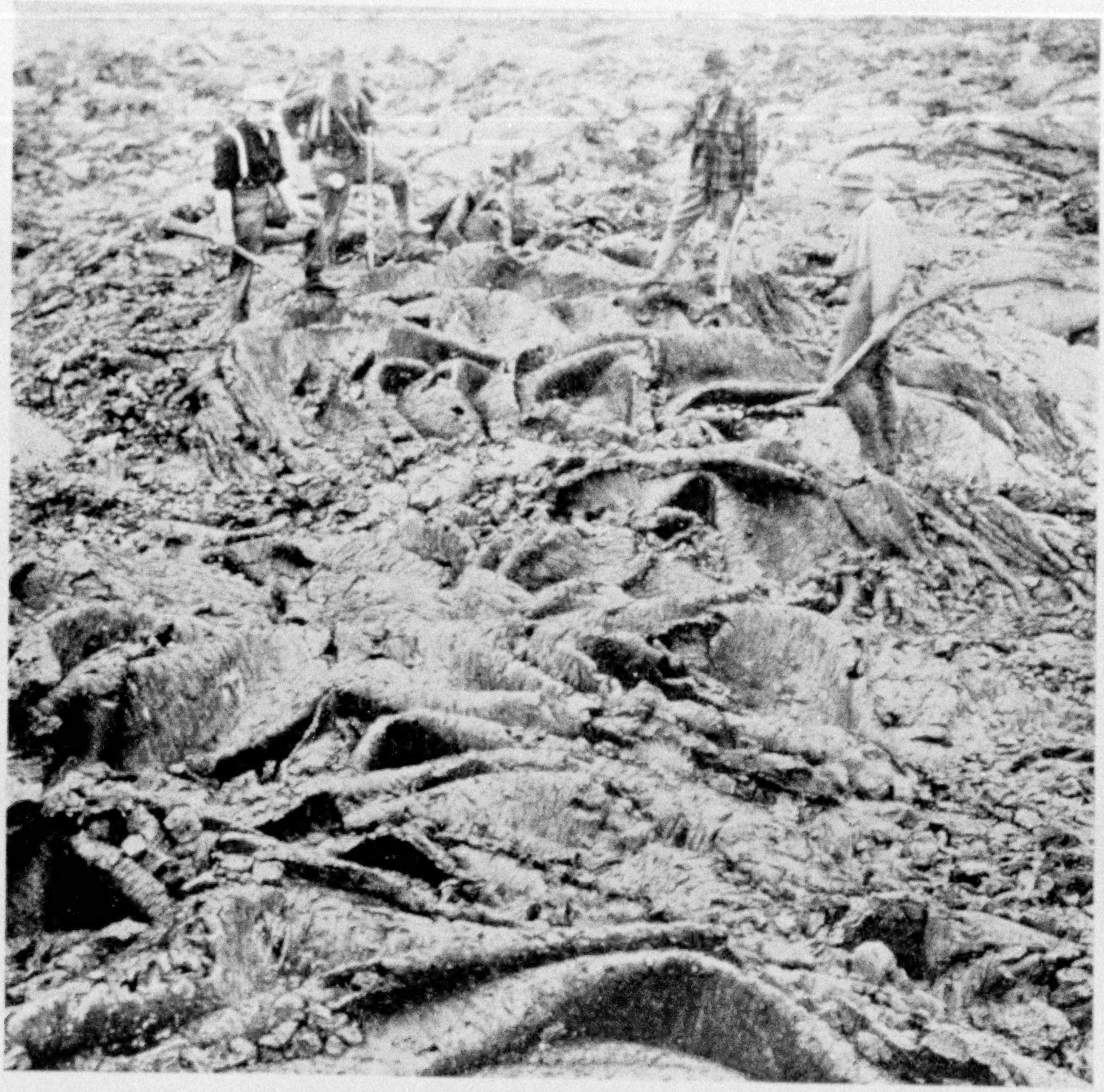
This is one of a series of eight caves found near the Bridge of Tears. It is an almost perfect model of a miniature theater, with a circular, sloping auditorium, a miniature bridge of lava for the stage, an orchestra pit, back drop, and domed ceiling. It is lighted by a 6-inch hole in the roof. The coloring of this group of caves is red, brown, and black, with splotches of white.

direction. We started out hoping that it would lift, but after an hour of aimless travel we decided to go back to camp.

Watson happened to be in the lead and we naturally followed him. I finally asked him where he was going, and when he said "camp," Cole and I undertook to show him where he was wrong. The fog by this time was so dense that 75 feet was about as far as we could see. The sun was invisible.

Watson in turn laughed at us. We referred to our compass, and the needle pointed in the direction we thought south. I suspected this to be another case of magnetic attraction, so tried a different direction finder.

No matter how dull the day, if you lay your knife-blade on edge on the back of your watch or on a piece of paper, there will be a faint shadow; turn slowly around until you lose the shadow, and in



FOLDED FORMATIONS OF THE PAHOEHOE FLOW

This lava formation is about 20 miles wide, and consists of ridges, folds, crevices, and cracks. Some of the shapes resemble crumpled blankets, knots, and ship's hawsers neatly piled. *Pahoehoe* a Hawaiian term for a smooth, ropy, lava flow (see page 311), means "having a satinlike finish."* Indians had marked the trail across this flow by laying rocks on pieces of sagebrush pointing to caves or water holes. Occasionally old trails, marked by gray streaks across the bare rock, worn by ages of travel, can still be followed for short distances.

that direction is the sun; point the hour hand of your watch there, and half way between that point and the mark 12, for the noon hour, is due south, or near enough for practical purposes. This checked our compass; we had to admit we were wrong. It was the first time in my life that I had been lost.

Watson now got his bearings from some rocks he had passed.

About a half mile northwest of the northern end of the Seven Devils we came upon a large cinder flat a mile long and a half mile wide. Here we encountered another strange feature of this land. In general, these flats were barren and packed so hard that an automobile might have been driven across at any place, but at this point we noticed a series of light-brown dots extending in lines crisscrossing the flats.

When we came to them we were surprised to find old bear tracks, into which the wind had carried a species of plant seed that had taken root and exactly filled

---

* See "The Hawaiian Islands," by Gilbert Grosvenor, in the NATIONAL GEOGRAPHIC MAGAZINE for February, 1924.

XUM

BIG CINDER BUTTE AND THE PAHOEHOE FLOW

This volcanic cone of reddish and black lapilli, the highest in this region, rises 600 feet from the plain, but was twice as large before its top and southwest side were blown off. Its slopes are covered with large pancakes of lava and with curious globular formations which resulted from the whirling motion of the lava as it was thrown high into the air. They range in size from a finger's length to 12 feet and are termed "volcanic bombs" (see illustration, page 313). The north and east sides of this butte are timbered with pines and quaking aspens.

the tracks. It was a small grayish-colored plant about one and a half inches high—hardly enough in some cases to show above the level of the tracks. Specimens I brought back have been identified as *Eriogonum acaule*, a pigmy variety of the buckwheat family.

Think of tracking a grizzly bear that had crossed here possibly hundreds of years before! In a few places wild rye grass had taken root and was crowding the smaller plant out.

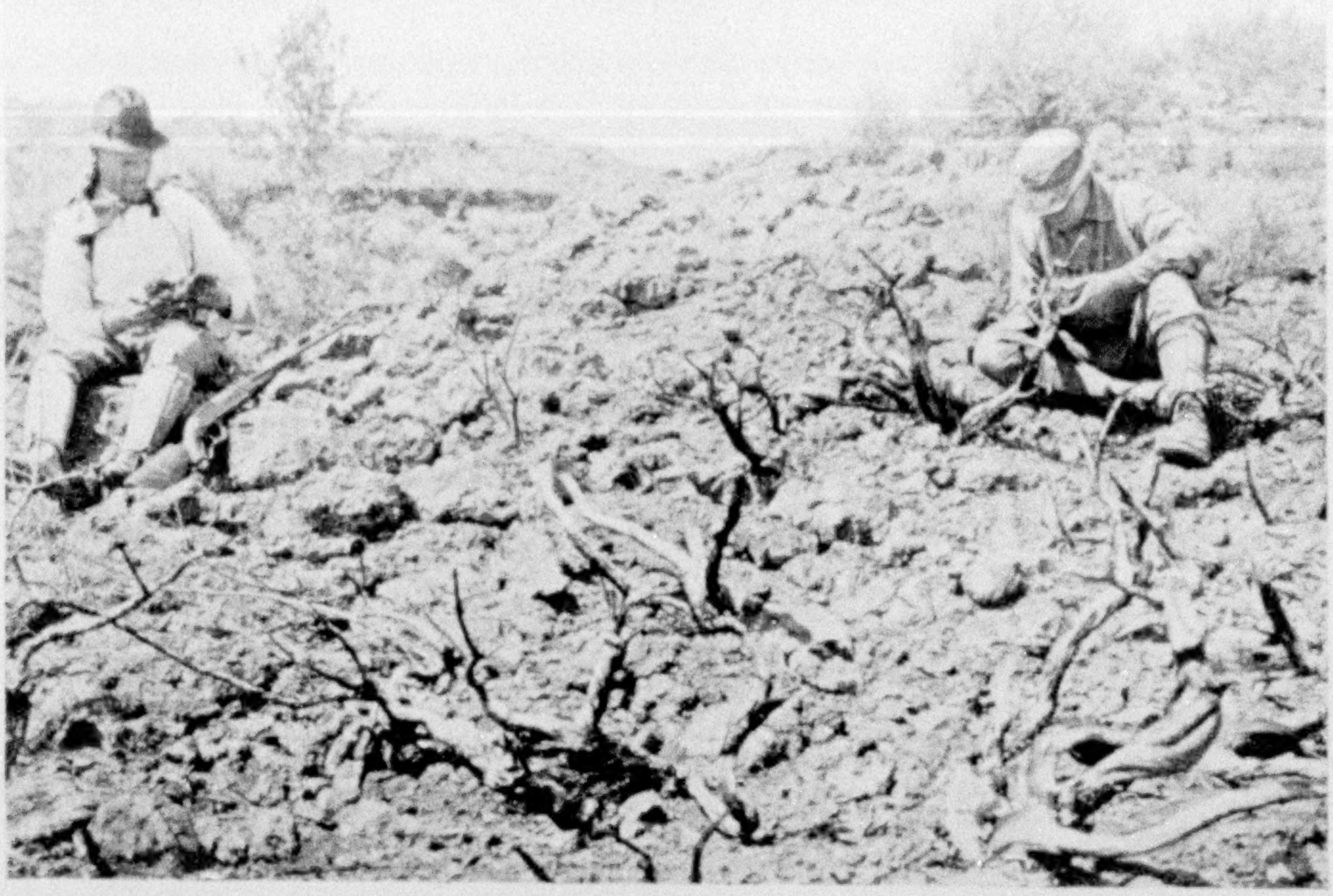
We called this place Bear Track Flat.

Adjoining Bear Track Flat on the north was a similar one having features all its own, which consisted of more than 100 blowholes or fumaroles. These had at some time spewed out lava through from 4- to 20-inch throats. In many instances they looked like old tree stumps, 3 to 7 feet high. All had holes in the top and these openings were spiraled or twisted like the riflings in a gun barrel. We saw one with two openings about 5 inches apart and 4 inches in diameter. Another was found that had forked about half way from its base. These branches had broken off and lay on the cinders, in appearance like pieces of twisted spiral pipe.

All the openings except three were plugged with bits of rock dropped in probably by Indians, as the old trail passed along the cinder flat 100 yards distant. Several were examined in which the opening angled off at a 45-degree slope and to unknown depths. They reminded us of a number of trench mortars, so we gave this the name of Trench Mortar Flat.

STRANGE FORMS OF THE LAVA FLOW

From our camp in Echo Crater we made an excursion for 9 miles out into a lava flow some 20 miles wide extending to the east. Most of the flow has a pahoehoe surface (see text, page 311). In places there are ridge after ridge and fold upon fold, with crevasses and cracks;



EXAMINING PROBABLE SIGNS OF THE LATEST ERUPTION

The sagebrush is charred and the lava pancakes are half an inch thick, with a high gloss on the upper surface. It is possible that the most recent lava flow in this region took place only 150 years ago. Six large streams flowed from the Cinder Buttes district at a late date, and three of them are as fresh as if they had congealed and come to rest but yesterday. The lava looks black, as one walks over it, but at a short distance and in certain lights it has a light-gray appearance, as if covered with dust. This surface "bloom" indicates youth and is absent from flows known to be older.

again, there are huge folds and waves, as if some one had crumpled a heavy blanket.

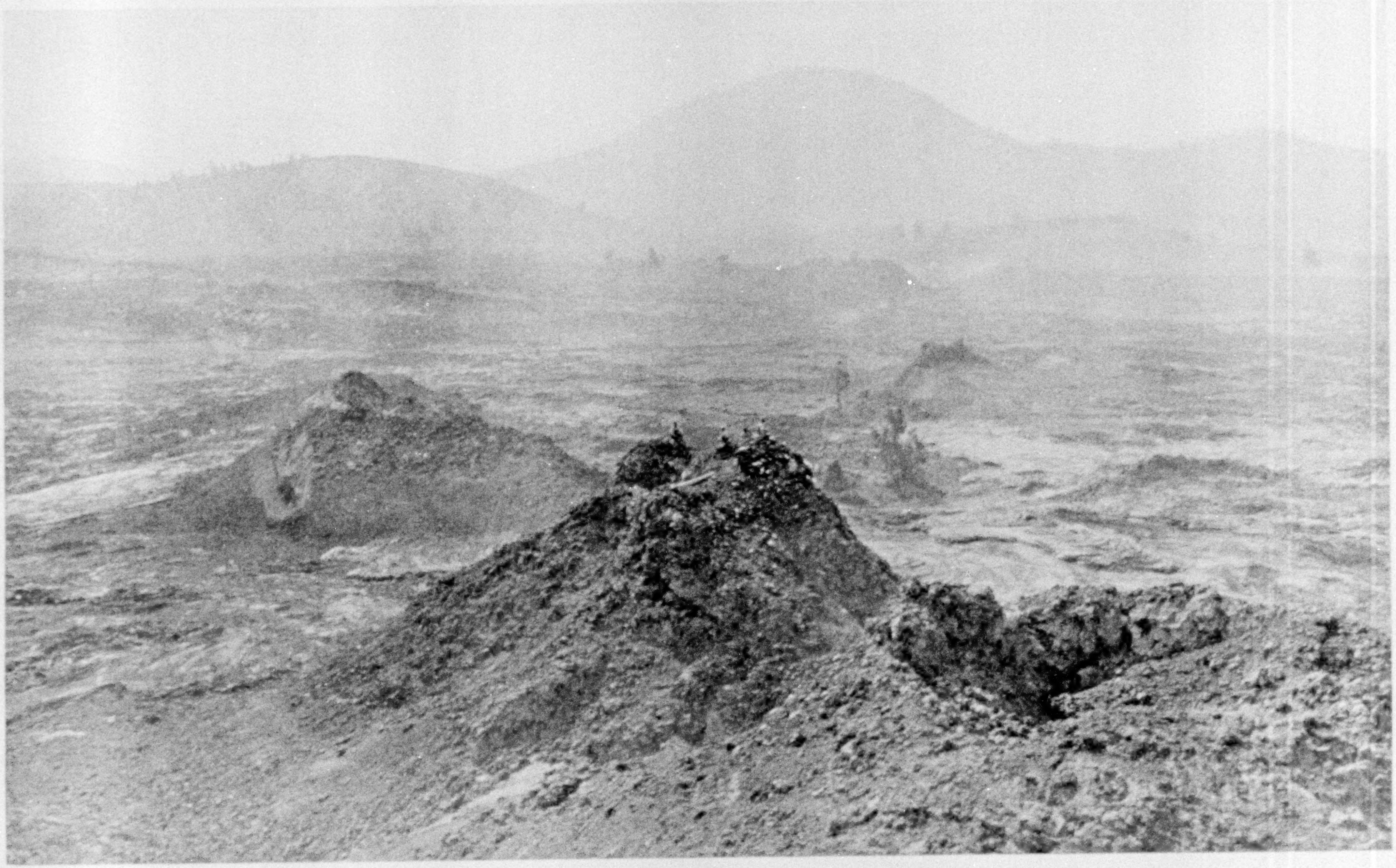
One place suggested a number of great ships' hawsers neatly piled; another had a long, sinewy twist of lava tied in as neat a knot as any sailor could make. How the ends could have twisted around and come through the loop is a mystery. I found a small specimen of this kind and carried it out with me. One flow had spread until it looked like an automobile speedway, except that it was broken by narrow cracks caused by cooling.

One day we crossed a stretch that tinkled with a hollow sound. Happening to notice that the surface was cracked and loosened in large sheets, we turned several pieces over and found the bottoms covered with jagged masses of nail-like projections all pointing in the direction of the flow. Many of the points were needle-sharp.

In one place the plastic lava had taken a circular, flowing motion while hardening, just as if it had been a large whirlpool several hundred yards across. Watson built a row of monuments from this lava formation back to the caves, described further on.

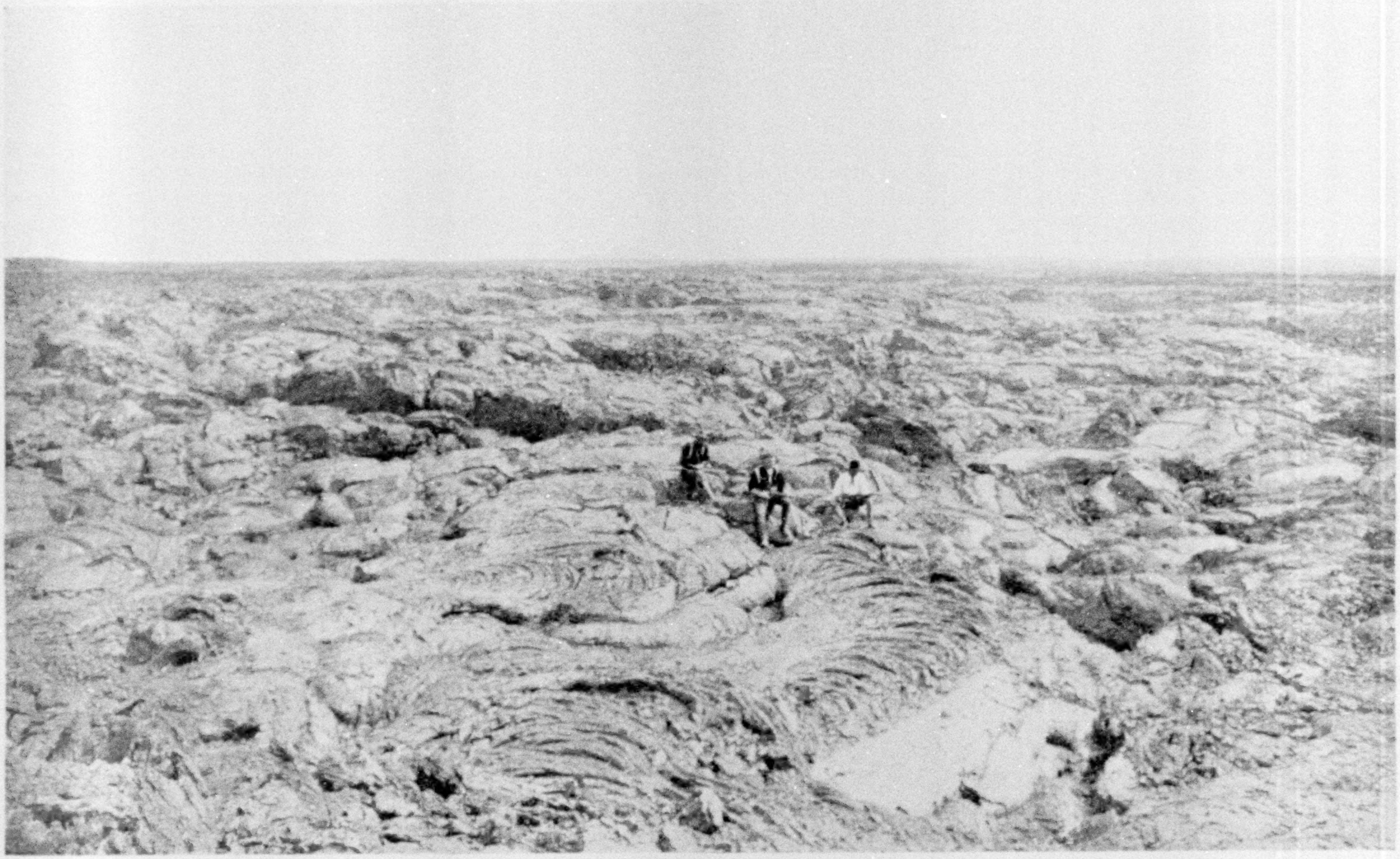
About four miles from Echo Crater we came to a large black hole. Climbing down, we entered a lava stalactite cave, each stalactite from 2 to 7 inches long and covered with green moss. We went in about 75 feet.

A short distance from this we reached a second moss cave, extending to the east. Farther on we found another cave, where, in the dust around the entrance, we discovered fresh bear tracks. As we started in, I asked Cole if there were any word he wanted sent to his folks. What he answered is not printable. About 20 feet in, the cave forked, one branch going west and the other northwest. We entered each of these about 100 feet, until they narrowed down, making it necessary to crawl.



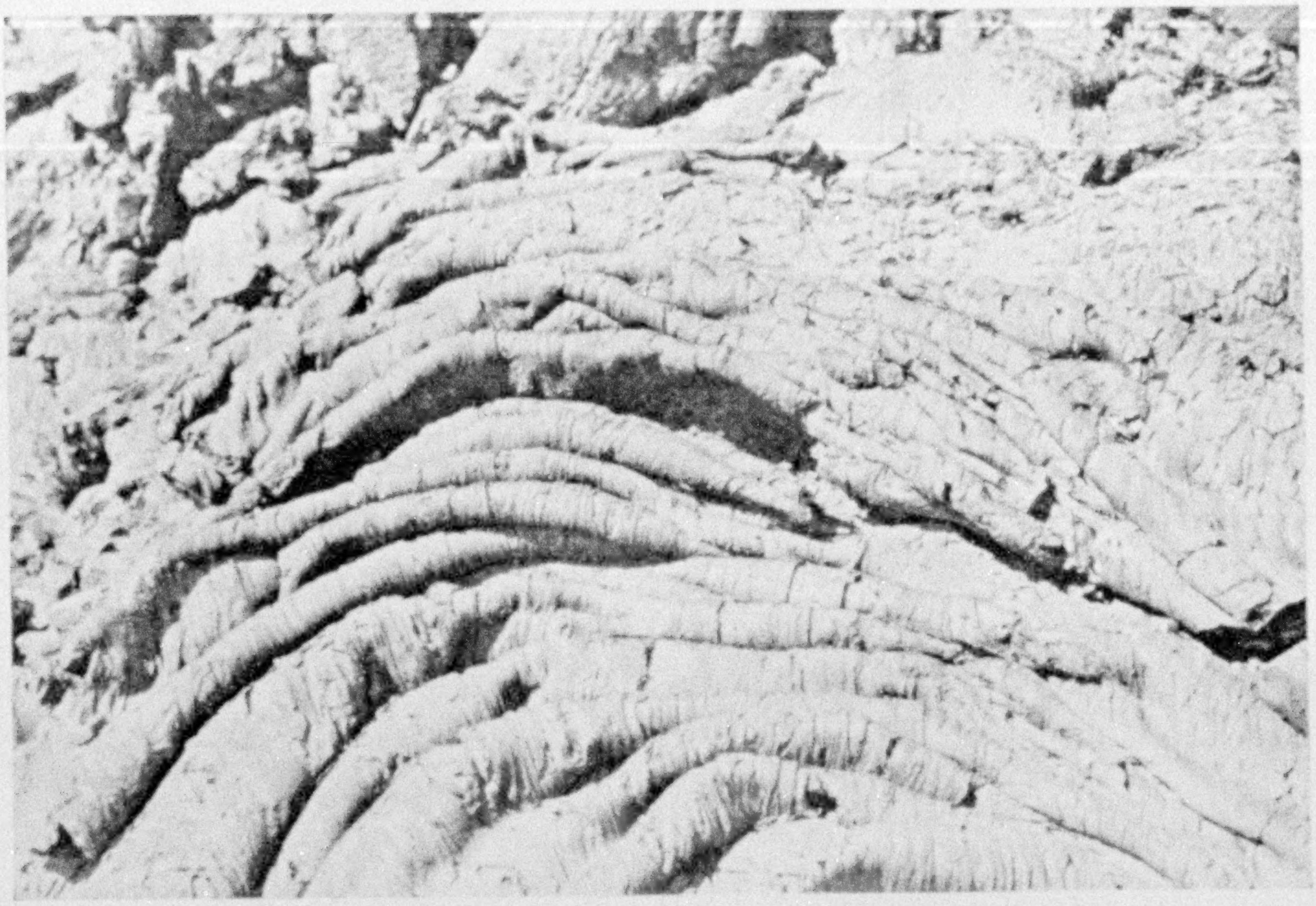
BOTTOMLESS PIT WHEN VIEWED THROUGH A MIST

Northwest of Big Cinder Butte the expedition found a row of seven lava sputter cones, one of which went down 40 feet and then opened up like an hourglass. Large rocks when rolled into it were never heard to strike bottom (see text, page 327).



THE STARTING POINT OF THE BLUE DRAGON LAVA FLOW

Perhaps the strangest features of this flow are its color and texture. Its tint is a deep cobalt blue, with a glossy finish, resembling varnish or enamel. The coating averages one-fourth of an inch in thickness. The play of light and shadow at sunset turns this formation into a twisted, wavy sea of grays, purples, blues, and blacks (see also illustration, page 322).



THE BLUE DRAGON LAVA FLOW

This remarkable flow is well named. Its surface is netted and veined with small cracks like scales of a prehistoric monster, while ropy twists of blue and gray lava, bursting through an older flow, have spread out in branches resembling the claws and legs of a dragon. This fantastic region of folds 30 feet wide, of whirlpools, gigantic snakes, and frozen waves, extends 11 miles to the southwest of Tycho Crater (see map, page 306, and text, page 327).

About 100 yards from the entrance to this cave, at the base of a cliff facing south, Watson discovered the entrance to a cave leading northwest. It also contained bear tracks.

East of the bear caves we came upon a natural bridge of lava arching a point where two cliffs of lava narrowed down. It had a 50-foot span, and from the floor to the roof of the arch was 15 or 18 feet. Its width was 75 feet. There was a pine tree growing under the east entrance. One of the party bumped his head on the roof near the edge, so we laughingly called this the Bridge of Tears (see illustration, page 313).

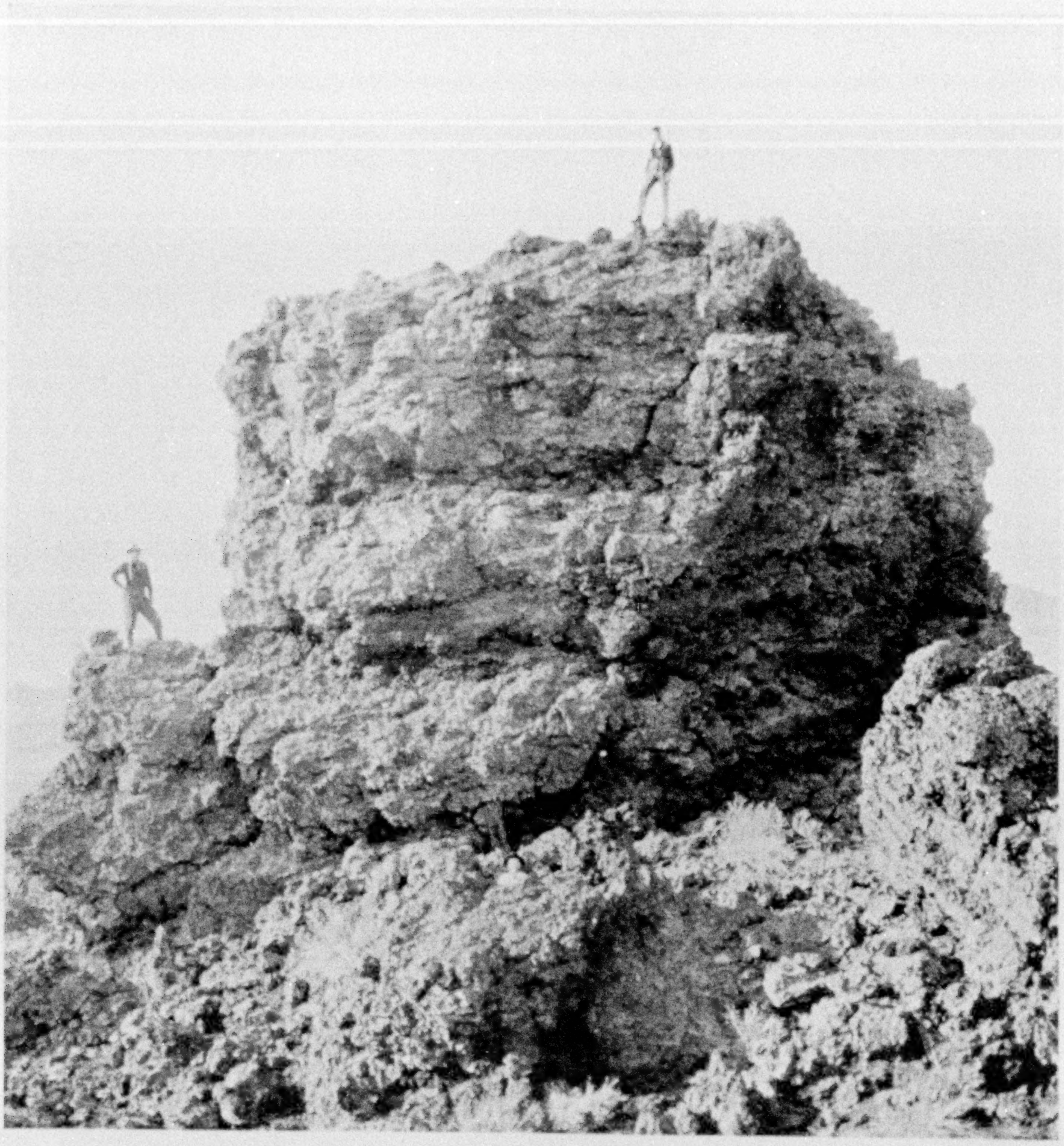
A CAVE FORMED LIKE A MODERN THEATER

East of the Bridge of Tears we came to the entrance of what we afterwards decided to call Amphitheater Cave. Climbing down, we found ourselves on the east side of a room some 40 feet wide and 60 feet long, with a domed ceiling 20 feet high.

As we sat on the north side, we beheld to the south a perfect stage. The floor was double, the lower section being about 8 feet lower than the top of the floor above, which was 15 feet wide. It was almost an exact model of a modern theater. To the right of the stage a large rock jutted up; imagination might call it one of the wings.

At the top of the dome the roof had caved in, leaving a circular skylight 6 inches in diameter. Back of the stage and starting on a level with the lower floor, the tunnel led away to the southeast.

We walked and crawled between a quarter and a half mile; but judging distance when part of the way must be made on all-fours and by candle light is difficult. Finally, the passage closed down until the roof was only 1½ to 3 feet high. Leaving Watson and Cole here, Martin and I crawled on about 200 yards, until we came to a place we christened Fat Man's Misery. Martin weighs about 125



"PUEBLO RUINS" OF VOLCANIC TUFA

These peculiar masses were formed when molten lava undermined the sides of a crater, large pieces of which broke off and fell on top of the flow. The fragments are usually black or various shades of red, and when viewed from a distance resemble pueblo ruins of the Southwest. They are from 10 to 80 feet in height and of many curious shapes.

pounds and made it easily; I made it, too, but in all pictures taken after that I faced the camera!

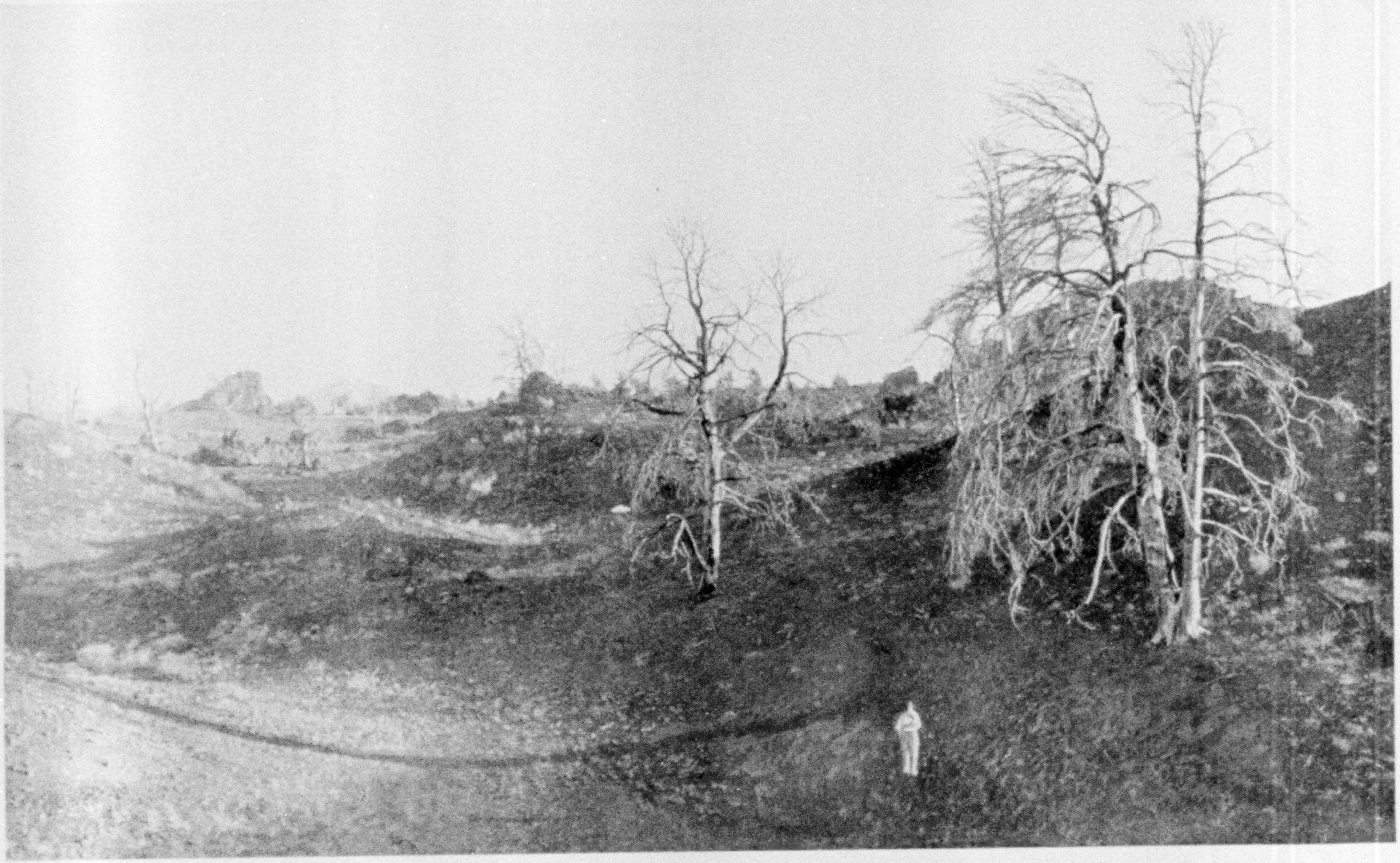
About 50 feet farther on, the passage opened up again, and then closed down, owing to a cave-in of the roof. We could see through, but could go no farther.

The roof throughout was covered with stalactites and the floor with jagged drippings from above. Crawling was a painful operation.

The coloring in these caves was red, brown, and black, with splashes of white.

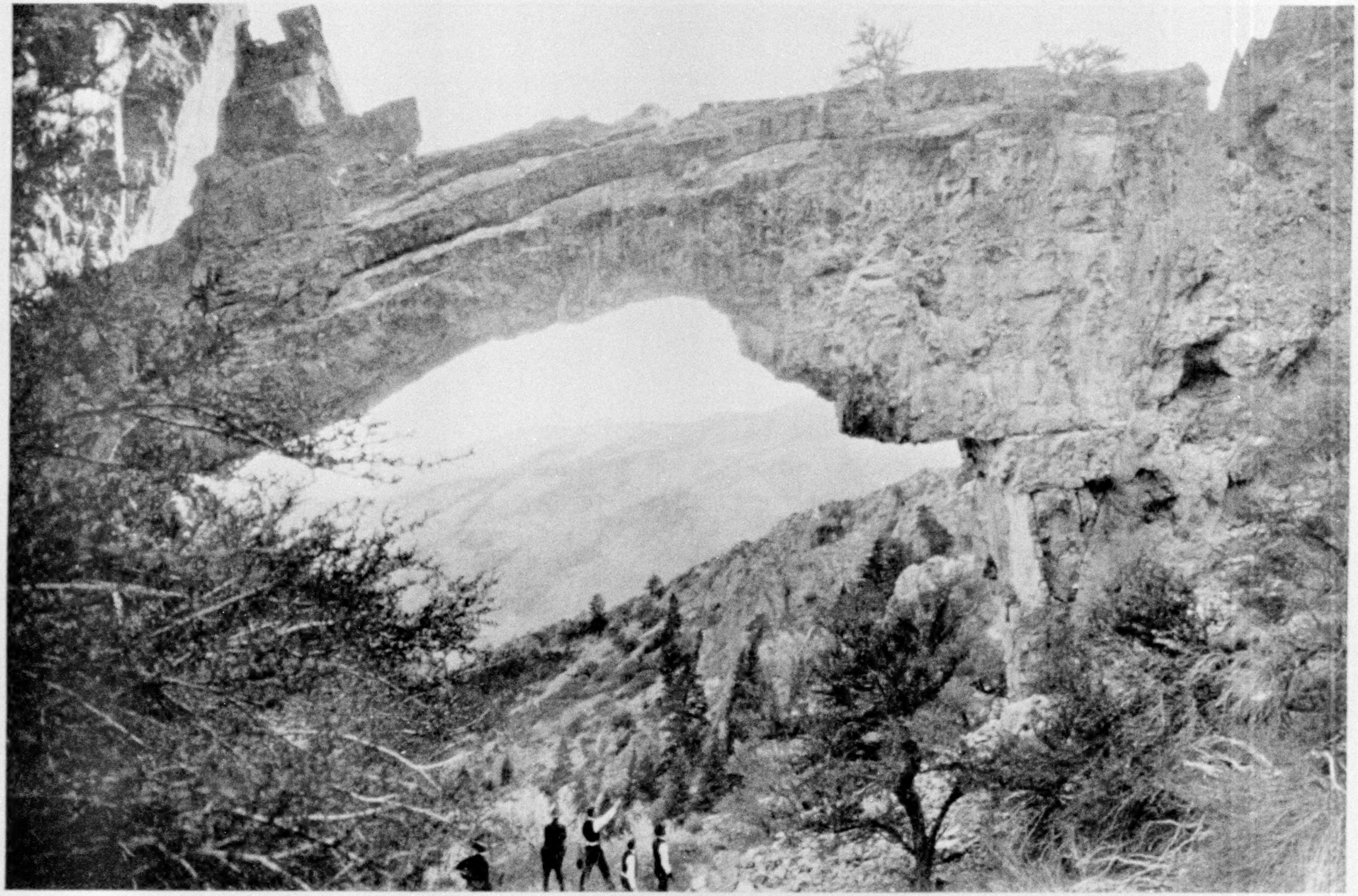
While proceeding east, Martin and I happened to leave the others to climb to a low mound in the flow. From this vantage point we sighted a lake a half mile long and, to the south of it, what appeared to be a grove of willows and cottonwoods. Turning the binoculars on the scene heightened the effect, and we decided to walk to another elevation, a mile and a half farther along, where we could look down into the basin. When we got there we sat for a few moments examining it, still apparently three miles off,

XUM



DEAD AND BURNED TREES WEST OF THE BUTTES (SEE TEXT, PAGE 328)

There is no positive evidence as yet to prove that the dead trees found on the borders of the lava flows in certain instances were killed by heat.



"THE BRIDGE OF THE MOON"

This gigantic stone arch has a span of 125 feet and a height of from 80 to 110 feet. Its golden-brown color contrasts sharply with the dark green of the pines below. As one looks through the arch from point to point in the landscape, the view changes from canyon walls and rocks to a series of green, yellow, and brown rolling hills, set off here and there, in the purple haze of the skyline, by the higher volcanic cones of Moon Valley.

ARCO TOWNSMEN WELCOMING THE EXPEDITION'S RETURN

The peculiar scenic beauties of the "Craters of the Moon" are unique in the United States. In due time this wonder-region will doubtless be opened up to tourists by a road which could be built from the northern end along its eastern side, following the open places that run back through the lava flows in narrow strips.

when suddenly lake, trees, and all floated away and disappeared in the distance. We had been the victims of a mirage.

AN AWESOME PANORAMA

A short distance northwest of Trench Mortar Flat lies the highest of the cinder cones in this region. As it stands today, it is about half its size before the explosion blew off its top and southwest side. The ascent to this point, known as Big Cinder Butte, was through a conglomerate of lava bombs and pancakes, where still plastic lava had fallen and flattened out. Near the top the cinders are broken by a number of jagged crags of red lava; the north and east sides of the butte are timbered with pines and quaking aspens.

From the summit we looked south over the country we had traversed, tracing our course through the maze of lava and cinder cones. On all sides were crater rings, showing we had examined but few of the many. We took turns in focusing the binoculars on the different features spread below. Very little was said except when one of us wished to call attention to something he did not want the others to overlook. We yielded to the influence of silence. Below us we counted six distinct lava flows, each comparatively fresh.

LOOKING DOWN INTO "BOTTOMLESS PIT"

To the north were many sputter cones and the shadowy outlines of craters deeper and larger than any we had passed. A route to some of these was planned, so as to avoid a large part of the rough, broken-up flow lying between.

Two miles northwest of Big

Cinder Butte we came to a row of seven lava sputter cones caused by molten lava which had been thrown out of a vent, piling up to a height of 60 feet. The southern one was the first climbed. Imagine finding a hole 15 feet in diameter and bottomless, so far as we could judge. It went down for 40 feet; then narrowed slightly, after which it opened up, giving the crater the shape of an hourglass. Large rocks rolled in were never heard to strike bottom. We called it the Bottomless Pit.

Near by a volcanic throat about 30 feet in diameter and 60 feet deep was found, full of snow and ice. From the sides hung large clots of lava. The outside slopes were covered with numerous volcanic bombs resembling double-ended pears. In many the ends had curved upward as they had fallen, giving the appearance of buffalo horns. A short way from this was the entrance to the narrow tunnel of another cave.

In this vicinity there were seven lava cones in a row, three of them in a state of perfect preservation. In climbing a high ridge to the north, in order to get a photograph, I descried three of the largest craters in the belt, one of which was a quarter of a mile across and several hundred feet deep. Its northern and eastern sides were perpendicular cliffs of a bright red lava, the balance being a steep cinder slope. The rim was almost a perfect circle.

On my first trip to this place, Albert Jones volunteered to climb to the bottom, to serve as a scale. To my surprise, he was invisible on the ground glass of the camera and could be found in the finished print only with the aid of a magnifying glass. In pictures of a place like this, the camera does not lie, but it does not tell all of the truth, for in its results the colors and gigantic scale of things are missing.

The north rim of this crater is a knife-edge, the other slope being the side of another crater, almost as wide and deep, formed by two explosions, which caused a double depression in the bottom. One contains a small lake. In the spring of 1919 it was about 100 feet in diameter; the following year it had shrunk to 40 feet. We called it Crater Lake and the crater, Tycho, after the large crater on the moon.

As we climbed around the crater walls we amused ourselves by rolling rocks down, watching them bounce and bound, sometimes 100 feet in the air. As they reached the talus slopes below, they reminded us of rabbits on the run, and I could not resist shooting at them. Once we united our strength and pushed a huge rock over the cliff, watching it fall until it reached the slope below, where it rolled, gradually getting smaller and leaving a cloud of dust in its wake.

A LAVA FLOW OF COBALT BLUE

Stretching to the southwest for a distance of about 11 miles, we saw perhaps one of the most remarkable lava flows in the world. Its color is a deep cobalt blue, with generally a high gloss, as if the flow had been given a coat of blue varnish. The surface is netted and veined with small cracks, having the appearance of the scales of some prehistoric reptile. Mr. Israel C. Russell, at one time of the United States Geological Survey, called it the Blue Dragon Flow. It merits the name, as in many places it has burst through the crevasse of an older flow, and the ropy twists of blue lava, spreading out in branches, together with its scaled surface, need but a little stretch of imagination to suggest the claws and legs of a dragon.

It is the play of light at sunset across this lava that charms the spectator. It becomes a twisted, wavy sea. In the moonlight its glazed surface has a silvery sheen. With changing conditions of light and air, it varies also, even while one stands and watches. It is a place of color and silence, the latter broken only by the wail of the coyote and chirp of the rock cony.

About a mile to the north of Crater Lake is an immense cinder cone, the west side of which has breached away, leaving the floor of the crater exactly as it must have appeared when the eruption of lava ceased. Here are bubbles, rolls, folds, and twists, as if a giant's frying pan of thick gravy furiously boiling had been frozen instantaneously.

We sat on the southern edge of the rim for perhaps half an hour before we climbed down. This flow had broken out and traveled northwest for several hundred yards, and then, having been dammed up, had broken through a low place in the cinder ridge and gone east. Here the channel was about 300 yards wide, and the flowing lava had assumed strange shapes and twists, as if a rapid in a mountain stream had suddenly congealed.

When the eruption occurred the molten lava undermined the volcanic sides, which fell in and floated off on top of the flow, like sticks and sawdust on the surface of running water.

Around the bases of the larger floating pieces of volcanic tufa there are depressions in the lava where the masses had pressed down, as occurs when a greased stick is floated in water. Some of these moats are from 4 to 10 feet deep and 10 to 30 feet across.

TEAPOTS, CHIMNEYS, AND SILOS MOLDED BY LAVA

A mile and a half out on the flow we saw hundreds of these crater-wall fragments, some as high as 80 feet. Viewed from a distance, they resemble the pueblo ruins of southwestern United States. One was about 60 feet high and not more than 20 feet in diameter at its base. From a distance it resembled a silo. How it remained upright as it drifted along is a mystery. Many more were observed that resembled chimneys 10 to 20 feet high, and one was an almost perfect teapot in shape.

About two miles southwest of Big Cinder Butte is a flow with similar formations. Along the north side of the Ruined Pueblo flow are 14 mounds composed of rock and sagebrush, which the Indians have built. They are from 4 to 10 feet long and about 4 feet wide. We had no means of digging into them.

Three well-worn Indian trails come into this belt from the north. The plainest is one that goes in about six miles west of Martin, near the sinks of a lost stream known as Little Cottonwood. It is distinct for about 11 miles, and then fades; yet we found traces of it all the way across. It is sparingly marked with small rock piles and pieces of sagebrush, with rocks to weight them. A few flint or obsidian arrow-points can be picked up along it. Where these trails go and why, no one knows.

Northward, a mile from the Ruined Pueblo flow, are a few more low cinder cones similar to those we had passed. Puzzling features along the west side of this volcanic belt are the many dead charred trees growing in a cinder flat absolutely barren of vegetation of any kind which could carry fire from one to the other. I found charred sagebrush around a lava blowhole near the Seven Devils. A piece of brush was picked up near this spot that had a clot of lava "frozen" around it.

In appearance the flows seem as if they had happened only yesterday, but in reality the latest probably occurred about 150 or possibly 200 years ago. Perhaps the eruptions of spattered lava around some of the small sputter cones occurred about the time of the eruption of Buffalo Hump, in Idaho County, Idaho, in 1866.

The total area of the six young lava flows of this region is about 300 square miles, while that extending above and below this point, along the Snake River plains, reaches the astounding total of approximately 27,000 square miles.

A report has been prepared by Mr. H. T. Stearns, of the U. S. Geological Survey, suggesting to the National Park Service that an area of 39 square miles be set aside as the "Craters of the Moon National Monument." In this area there occurred a fissure eruption displaying surface phenomena which are paralleled only by those in Iceland.

Notice of change of address of your GEOGRAPHIC MAGAZINE *should be received in the office of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your May number, the Society should be notified of your new address not later than April first.*

AUSTRALIA'S WILD WONDERLAND

By M. P. Greenwood Adams

With Illustrations from Photographs by William Jackson, Nor' West Scientific Expedition of Western Australia

ELEVEN million dollars' worth of mother-of-pearl shell and three million dollars' worth of pearls were won, in a period of ten years, from the waters of the Indian Ocean which lap the shores of Western Australia.

Pearl fishers, with their Asiatic crews and divers, scour the coast for 1,100 miles, from Sharks Bay to the north of King Sound. Their activities date back to the early fifties.

Western Australia produces more than three-fourths of the world's pearl shell, and the principal center of this valuable industry is Broome, a straggling township of some 4,000 Asiatics and a few hundred whites, each group occupying its own section of the town.

The Asiatics are employed in the pearl fishing under a special clause in the White Australia Act, which otherwise excludes the entrance of all colored peoples into the Commonwealth.

Fifty-odd years ago there was not a single European settlement in this vast section of Australia, and even now the census returns give a population of less than 7,000 souls, exclusive of aborigines.

From 1628 the northwest coast was visited by many bold mariners, including De Witt and William Dampier, but it was not until 1837 that the first definite attempt at exploration was undertaken by Captain George Grey—an attempt that was only partly successful. The first pastoral settlement in the Roebuck Bay district was established in 1863, and in 1879 Alexander Forrest made his memorable trip, via Beagle Bay and King Sound, to the Fitzroy and Margaret Rivers.

In 1882 Sir John Forrest, of Bunbury, the noted Australian explorer and statesman, made an investigation in this division, and shortly afterward Hall and Slattery discovered the first payable gold in the country at Hall's Creek. Then definite settlement of this great tract of country really began.

It was at Broome, with its glaring sun heat, that the Nor' West Scientific and Exploration Company of Perth, Western Australia, chartered the little 22-ton schooner *Culwulla* and secured the services of Captain Johnson as navigator for the purpose of making a comprehensive investigation of the northwest coast from Broome to Wyndham, the small township at the head of the Cambridge Gulf—a trip made possible through the enthusiasm and financial aid lent by Mr. A. E. Cockram, a citizen of Perth (see map, p. 332).

Under the leadership of Mr. E. J. Stuart, of Perth, and with William Jackson, photographer, the little party of explorers sailed at daylight one morning in May, on a voyage that supplied as many thrills as the most ardent adventurer could hope to encounter in these enlightened times.

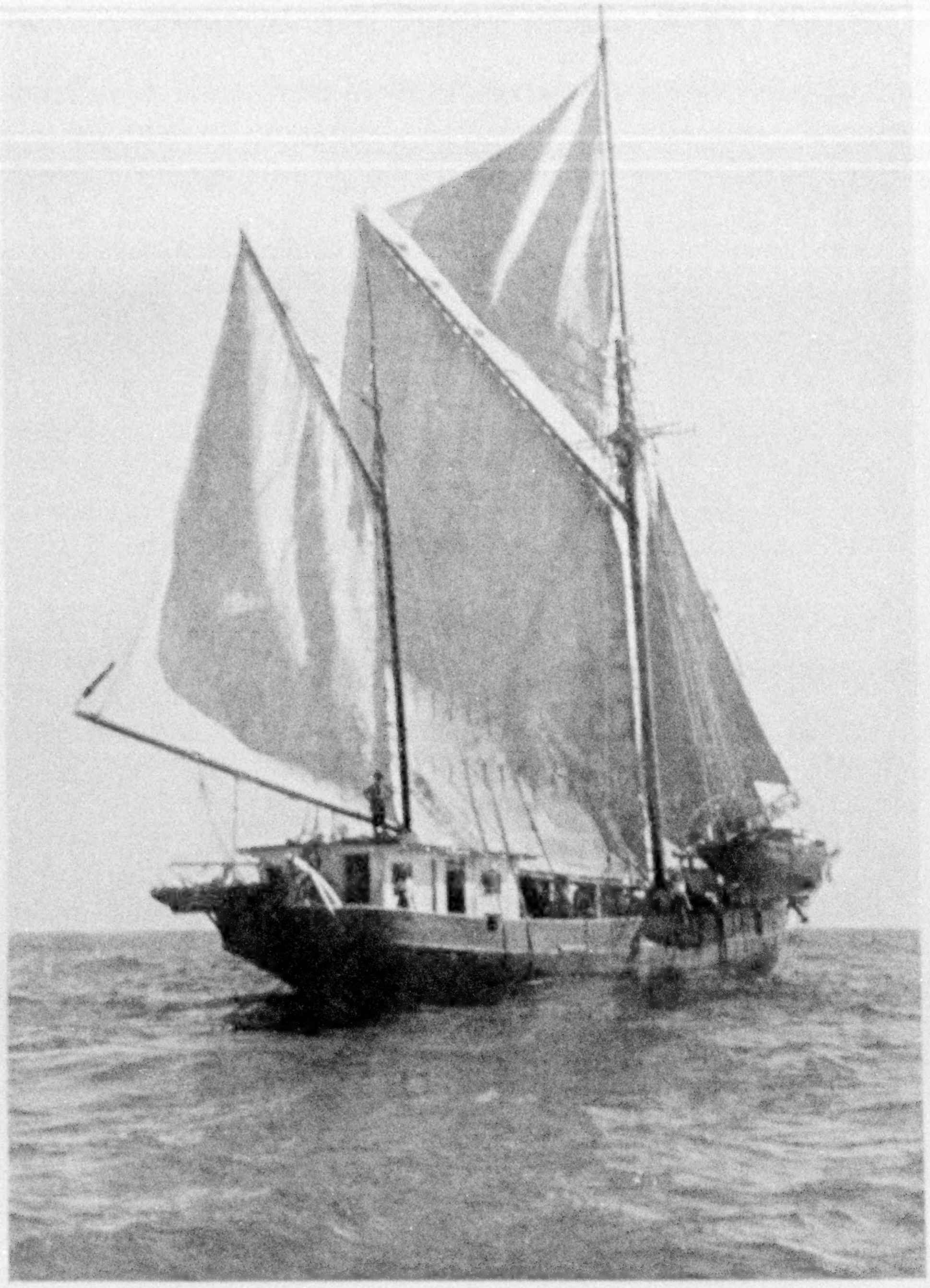
A run of 90 miles along the coast brought the party to Ledge Point, where a visit was made to Beagle Bay Mission Station, established 30 years ago by a Spanish religious order. There are 250 blacks permanently at the station, while tribes from the outlying districts make it occasional visits. This mission controls 10,000 acres of land, has several thousand cattle and hundreds of goats and pigs. Coconut and date palms flourish and water is obtained by sinking deep wells. Artesian bores are very common in Australia, many of them tapping water thousands of feet below the surface.

The station consists of 60 buildings scattered over 30 acres, well irrigated with bore water.

WHERE WATERS RECEDE SEVEN MILES AT LOW TIDE

North of Beagle Bay is Chilli Creek, where there is a 28-foot tide. At the ebb the waters recede nearly seven miles.

Under the mangrove trees which fringe the coast there are millions of crabs. Some are bright blue, others scarlet—all about the size of a 50-cent piece—while



THE "CULWULLA," THE NOR' WEST SCIENTIFIC EXPEDITION SCHOONER

larger crabs, three inches long and of a yellow color, simply swarm over the sand. The yellow crabs form into battalions, as if directed by officers, and will show fight when hard pushed (see page 340).

The fisheries wealth of this coast is remarkable, every inlet and river teeming with valuable edible fish. At Broome, a system of catching fish by means of traps is in vogue. The traps are made of wire netting, with wings which form a race. The tide does the work. The traps are covered at high tide, and when the water rushes out, fish are swept into the wire, being caught by the ton.

At Tyra Island, which is reached through wild and swirling tides, M. d'Antoine, a Frenchman, has lived among the blacks for more than 30 years. He owns a lugger, lives in a bark hut, and has a retinue of some 50 blacks—men, women, and children. As a typical beachcomber, he is far from being the picturesque figure that many writers about tropical lands and isles describe.

At the entrance to King Sound, there is a group of islands known as the Buccaneer Archipelago. On Sunday Island, one of this group, Sydney Hadley has a mission station, where he utilizes the black *gins* (women) for collecting the trochus shell, which he ships away. It is from the trochus shell that so-called pearl buttons are made — an industry carried on in France and Japan.

North from the Sound lies the "Graveyard," the *bête noire* of the skippers of the coast, where tiny islands and dangerous reefs are sprinkled all over the sea. Captain Johnson took the *Culwulla* through the Graveyard and passed safely to the more tricky Whirlpool Pass, where the little craft made three complete turns in the comparatively narrow channel, a little more than four miles in length.

At times this pass is quite unnavigable. Its banks are more than 400 feet high in places, very rocky, and run sheer down. The rise and fall of tide here is 35 feet.

HUNTING THE DUGONG OR SEA COW

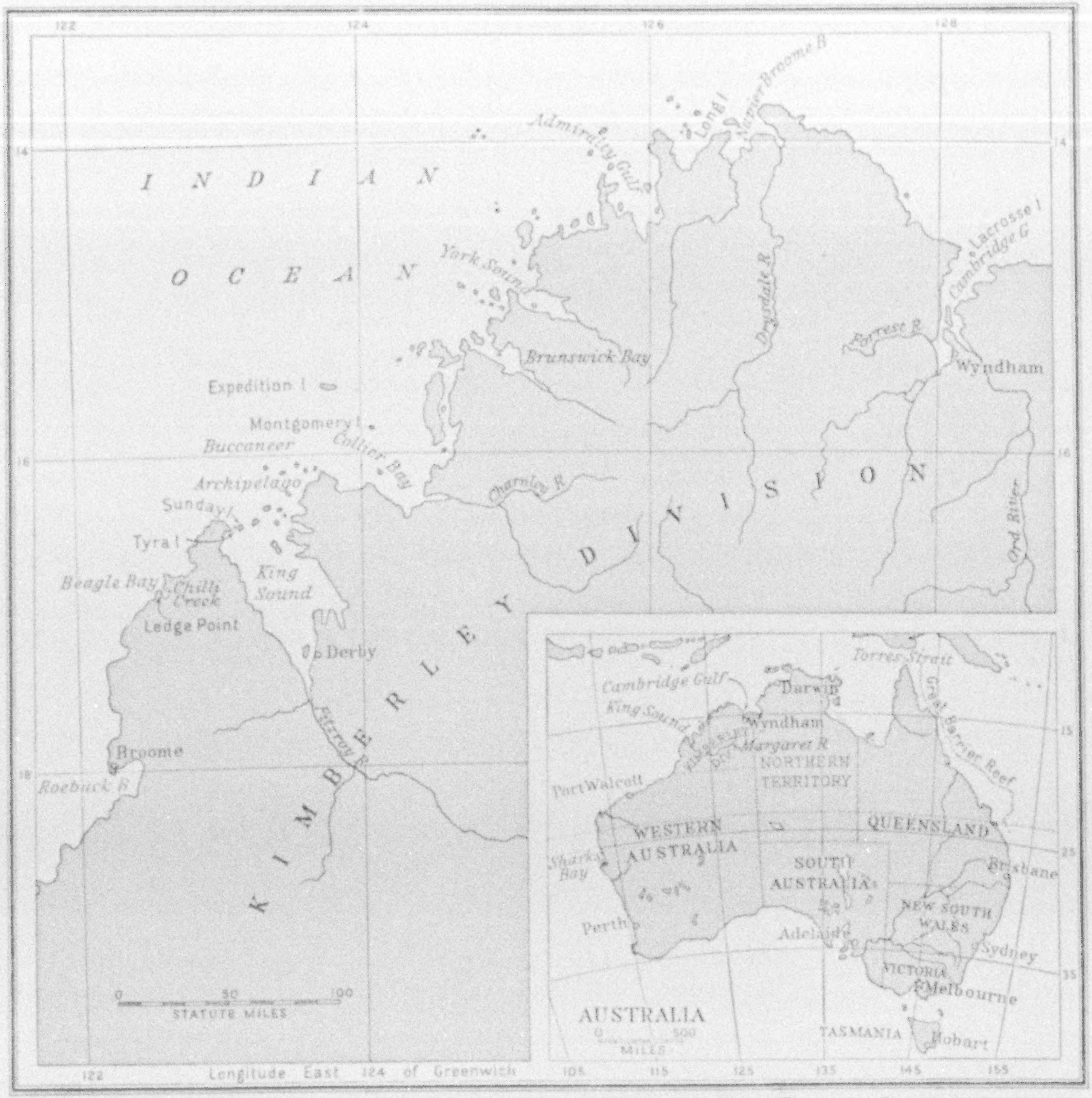
At Dugong Bay, an inlet in Collier Bay, several splendid specimens of the sea cow or dugong were captured (see page 343).

The hunting of the dugong was carried on by four enormous blacks who, with

A PEARLING FLEET RETURNING TO BROOME

THE ASIATIC CEMETERY IN BROOME

Broome is the center of fisheries which produce about three-fourths of the world's output of mother-of-pearl shell. The death rate among the Japanese and Malay divers is very high, and during the busy season at Broome it is not unusual for a burial to take place almost every day.


INDIAN OCEAN
Admiralty Gulf
Long I
Napier Broome B
York Sound
Brunswick Bay
Drysdale R
Lacrosse I
Cambridge G
Forrest R
Wyndham
Expedition I
Montgomery I
Buccaneer Archipelago
Collier Bay
Charnley R
Sunday I
Tyra I
Beagle Bay
Chilli Creek
King Sound
Ledge Point
Derby
Fitzroy R
Broome
Roebuck B
Ord River
KIMBERLEY DIVISION
0 50 100
STATUTE MILES
Longitude East 124 of Greenwich
Cambridge Gulf
King Sound
Darwin
Torres Strait
Great Barrier Reef
Wyndham
Margaret R
NORTHERN TERRITORY
Port Walcott
WESTERN AUSTRALIA
QUEENSLAND
Sharks Bay
SOUTH AUSTRALIA
Brisbane
NEW SOUTH WALES
Perth
Adelaide
Sydney
VICTORIA
Melbourne
AUSTRALIA
MILES
TASMANIA
Hobart

Drawn by Charles E. Riddiford

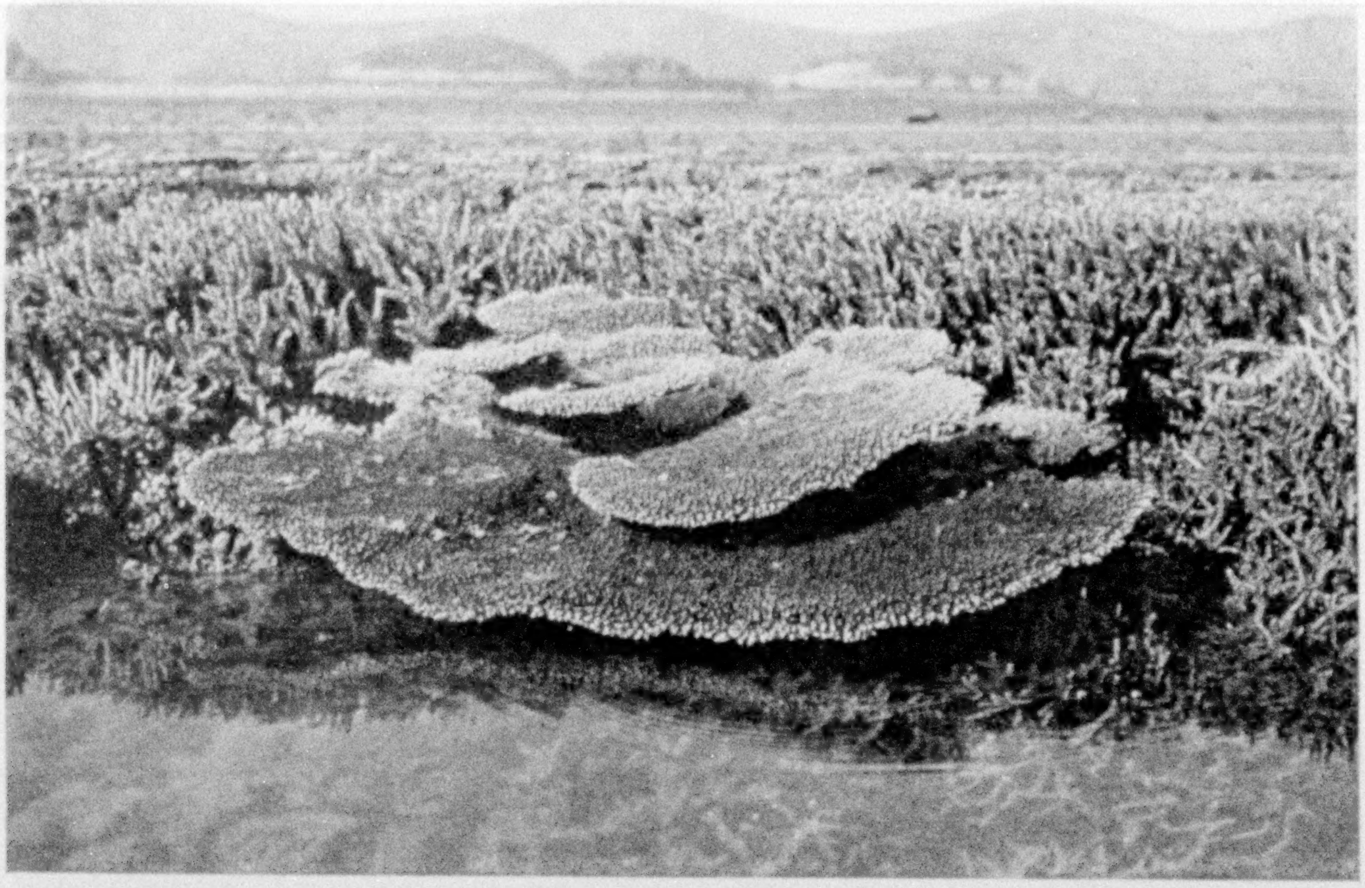
A MAP OF THE NORTHWEST COAST OF AUSTRALIA

the permission of Mr. Hadley, joined the party at Sunday Island. They proved a great asset as good workers and as interpreters when the party met strange blacks. At times, however, the Sunday Islanders were foiled, as the aborigines in different localities speak different dialects. Blacks from down south cannot make themselves understood when they encounter tribes on the northern coast and on the islands.

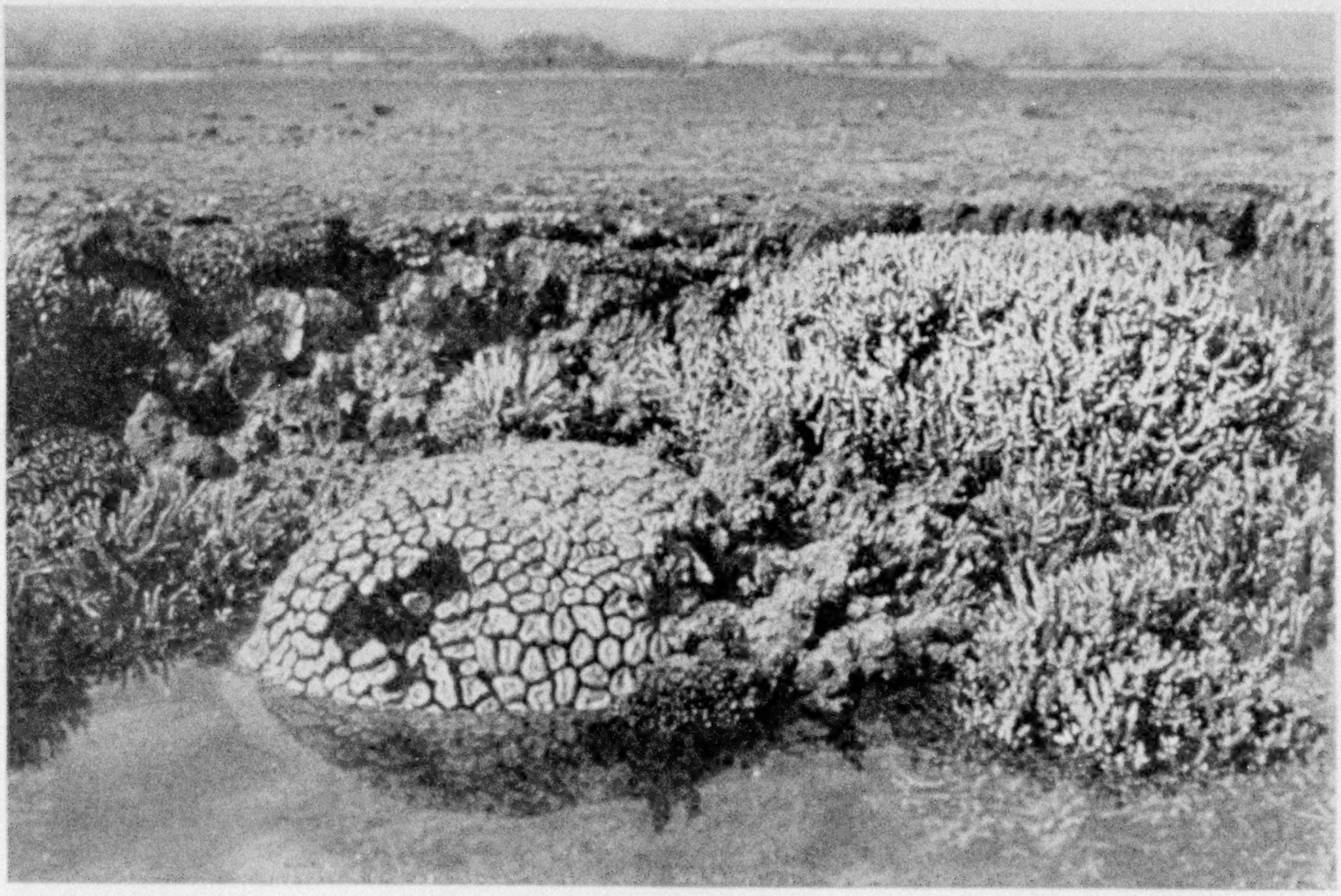
The dugong is caught like the whale, but, owing to the great thickness of its hide, many spears are turned and broken; so the hunting is not always carried out with success. This mammal is believed by some to have suggested the idea of the mermaid, because it holds its young to its breast and suckles it. The flesh has a flavor akin to both beef and pork, and it is eaten by whites and blacks alike. The meat is used like bacon, fine leather is made from the hide, and the oil obtained from the animal possesses valuable medicinal qualities, having extraordinary powers of penetration.

The dugong industry is being rapidly developed in the State of Queensland and is proving a most important asset. In the North West the blacks hunt these sea cows on a rough raft constructed of mangrove saplings pinned together with hardwood pegs.

The Sunday Islanders speared a splendid specimen that measured fully 12 feet



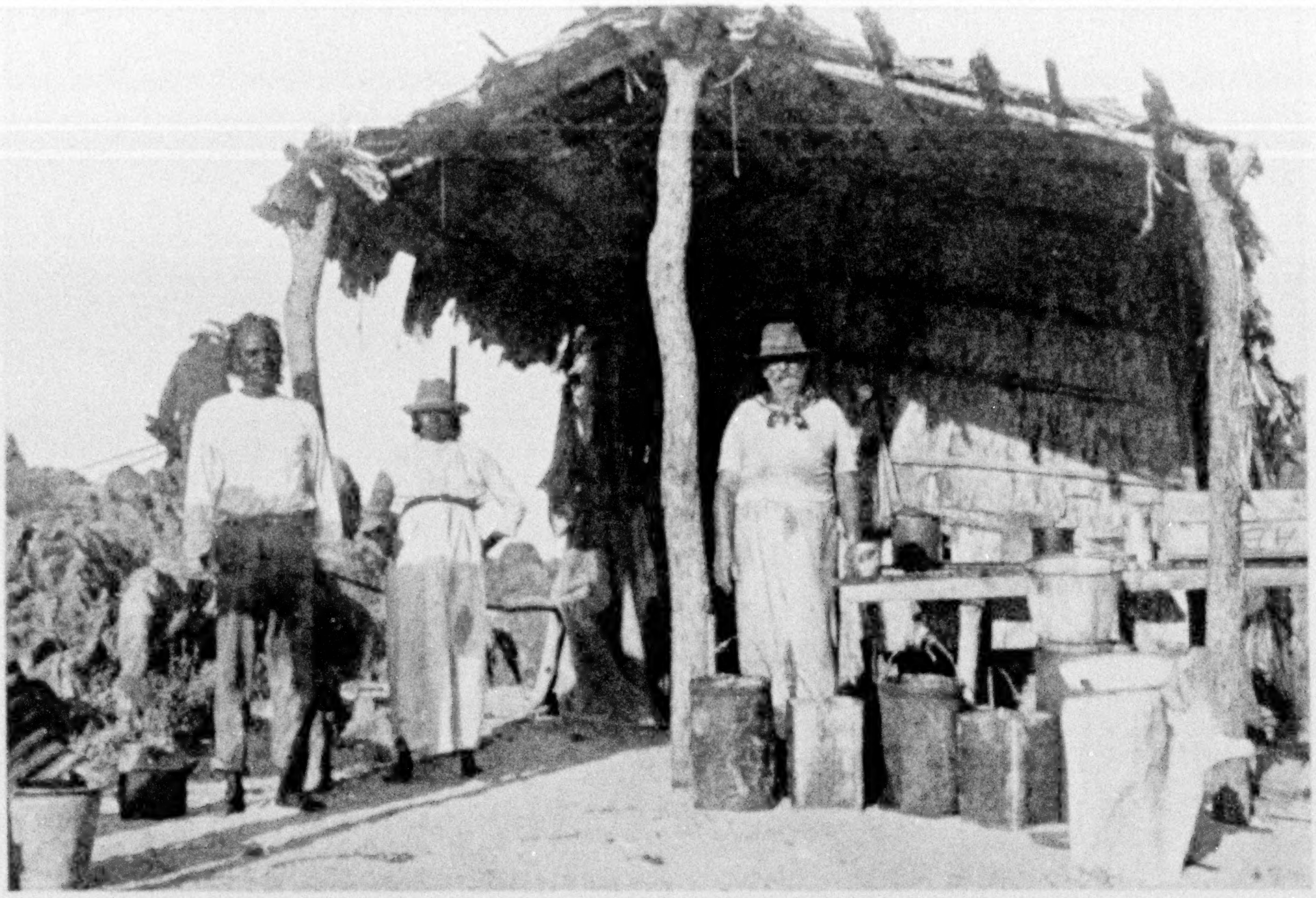
TWENTY SQUARE MILES OF CORAL



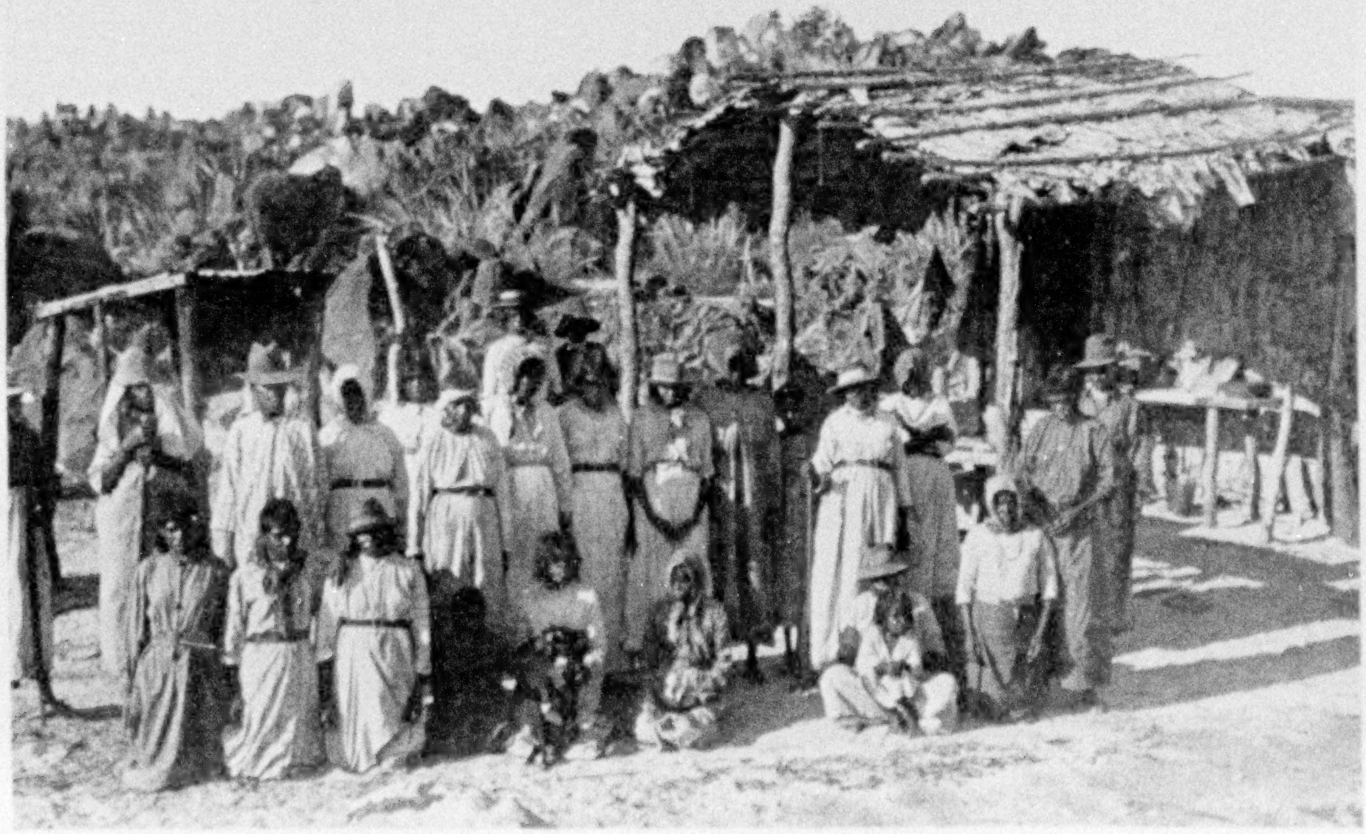
ANOTHER VIEW OF THE CORAL REEF OFF MONTGOMERY ISLAND

The coral reefs of northwestern Australia are magnificent in formation and beauty of coloring. In order to obtain this picture, the Nor' West Scientific Expedition chopped and blasted a channel which allowed the water to drain from one of the picturesque lagoons left by the tide on the top of a great section of coral. When the water in the lagoon fell about seven feet, a dingy was placed on the lagoon, and in this craft the photographer secured the pictures. The coral is built up by that industrious little marine creature which is responsible for innumerable atolls and small islands in the great South Seas and Indian Ocean.

XUM

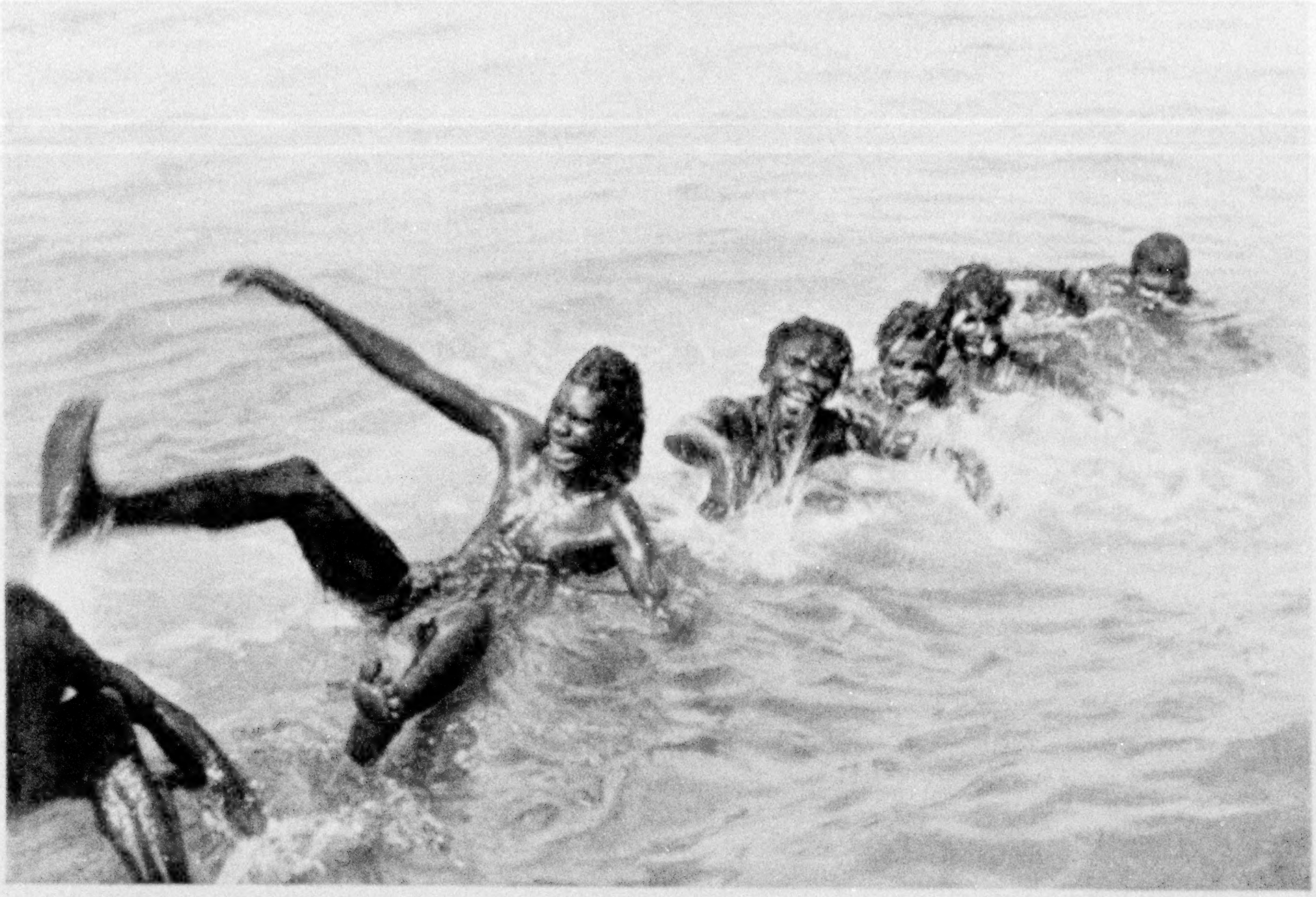


THE RULER OF TYRA ISLAND IN HIS BARK HUT

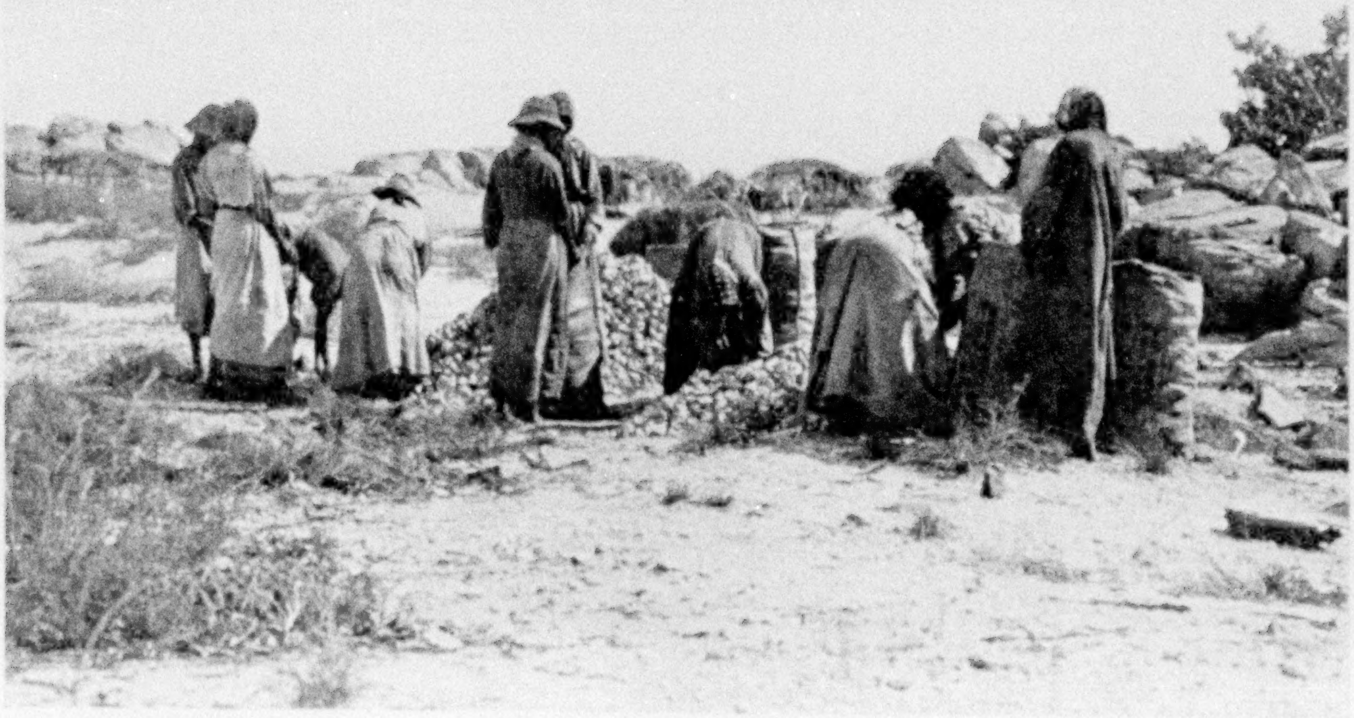


THE TYRA ISLAND POPULATION

M. d'Antoine, known as "Frenchie," has lived among the blacks for 40 years and is an extraordinary man—a typical beachcomber. He owns a small lugger, which enables him to touch civilization once in a while to dispose of his beachcombings, mother-of-pearl shells, trochus shells, etc., and to secure supplies (see text, page 330).

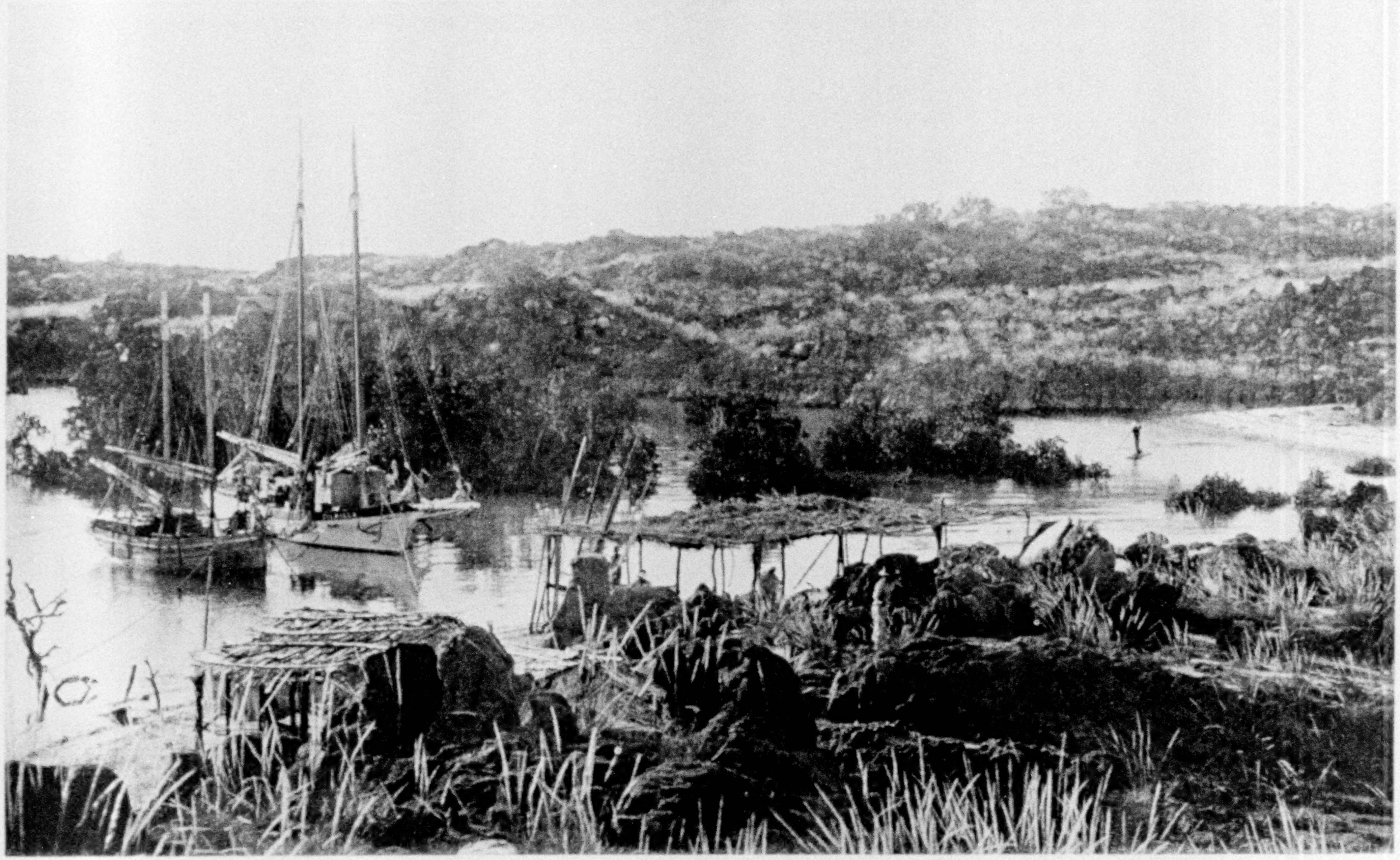


MONTGOMERY ISLANDERS EXPERIENCE AN UPSET IN THEIR DUGOUT

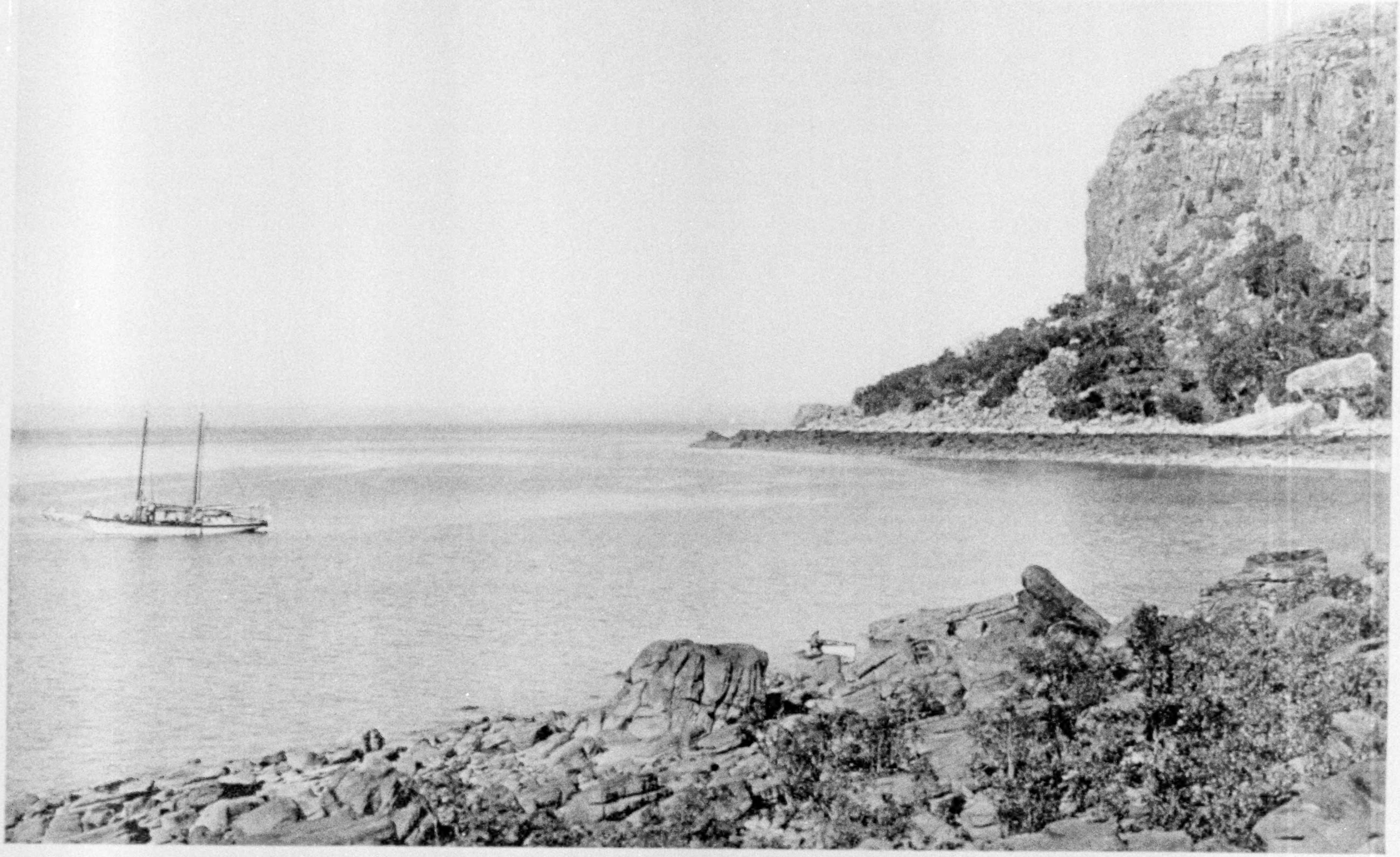


"GINS" (BLACK WOMEN) GATHERING TROCHUS SHELL ON SUNDAY ISLAND

The largest and handsomest of the trochi, or top shells, are found in the Indian Ocean and Australian waters. All are pearly inside. One of the small opalescent varieties is gathered in quantities to be strung into necklaces. From another variety bracelets are cut from cross-sections, five or six being worn on one arm.



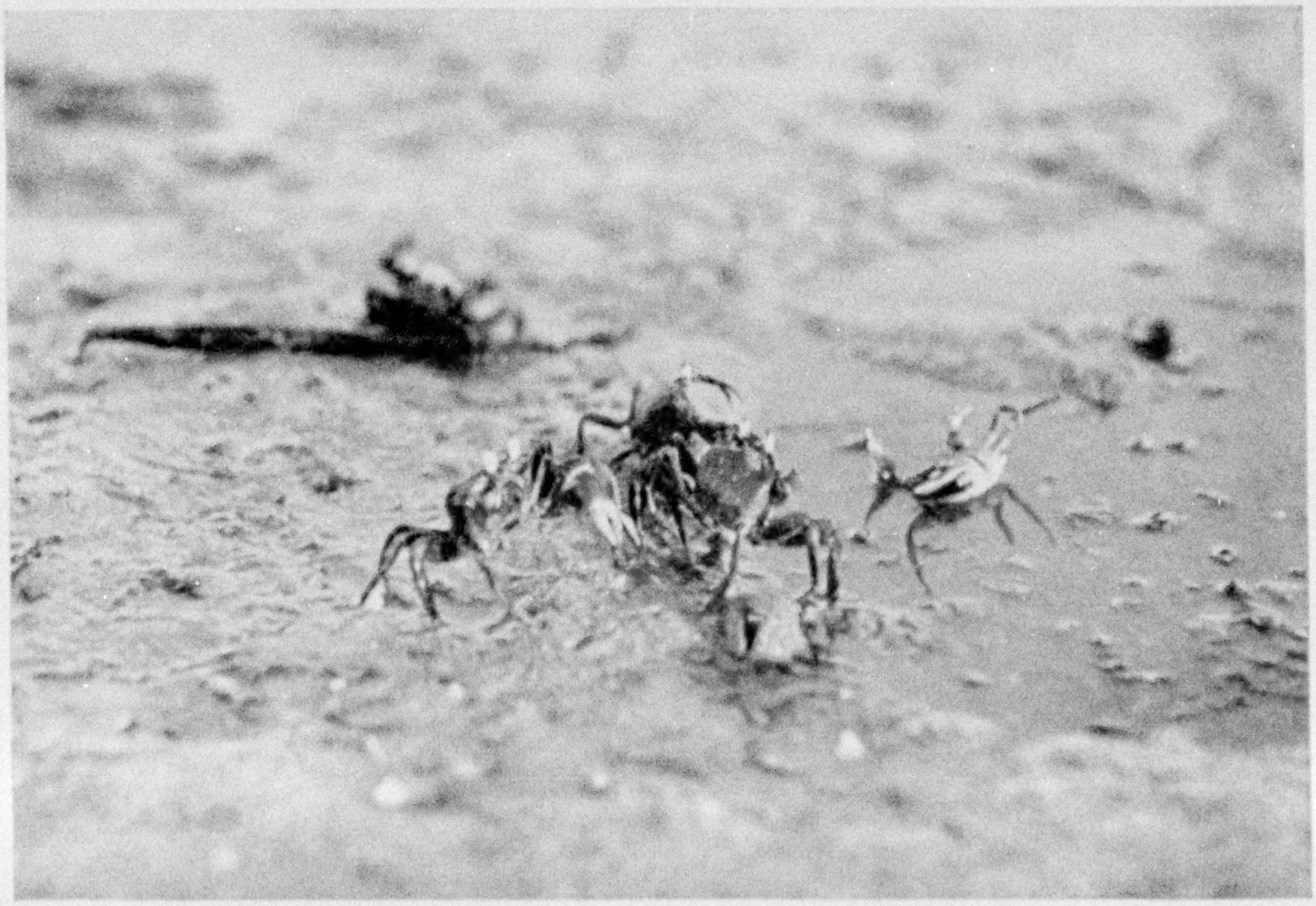
THE "CULWULLA" AND THE BEAGLE BAY MISSION SCHOONER IN CHILLI CREEK



THE "CULWULLA" AT OYSTER BAY, A SMALL INLET ON THE NORTHWEST COAST

FLEDGLINGS IN A SEA HAWK'S NEST

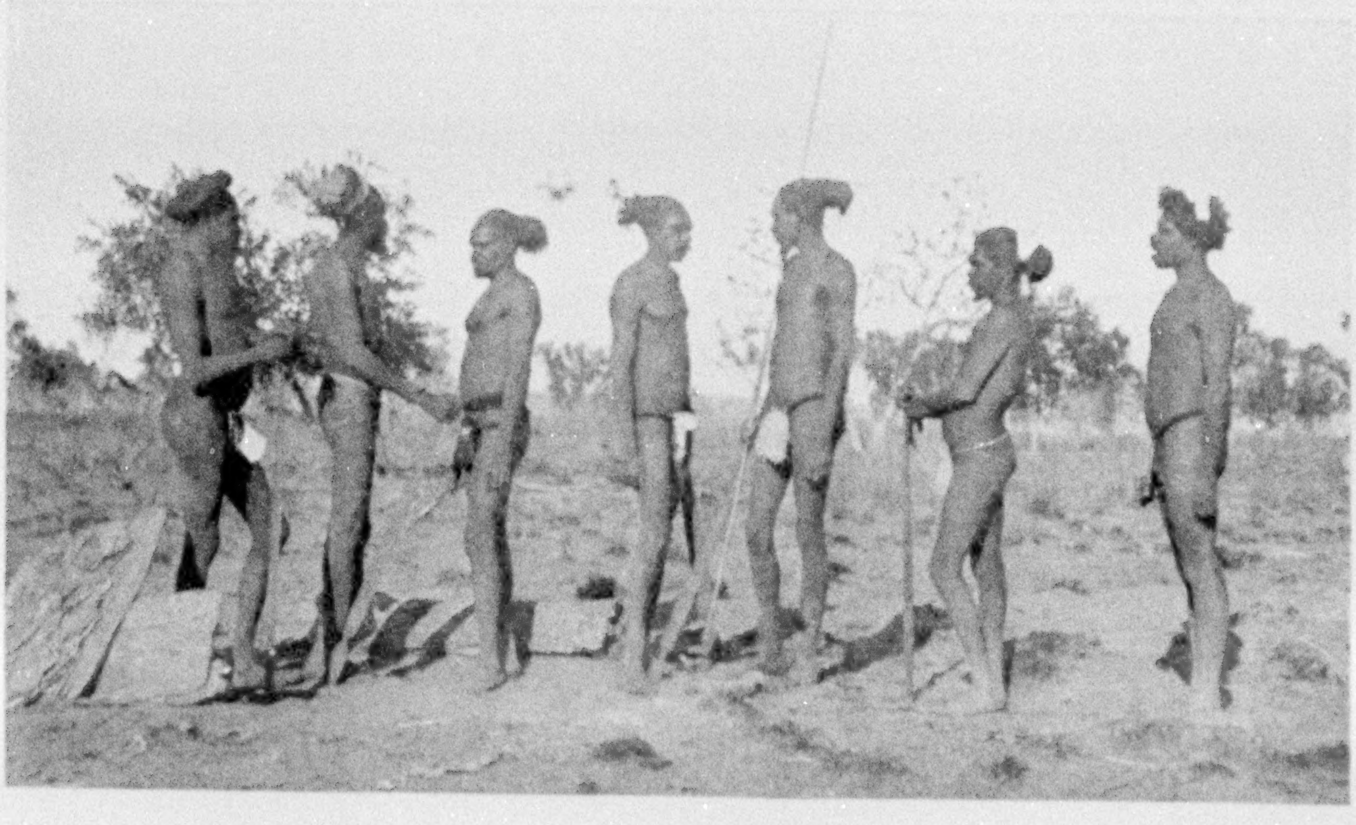
These large nests, composed entirely of sticks and bark, are to be seen on many of the headlands of the wild northwest coast of Western Australia (see also illustration on the opposite page).



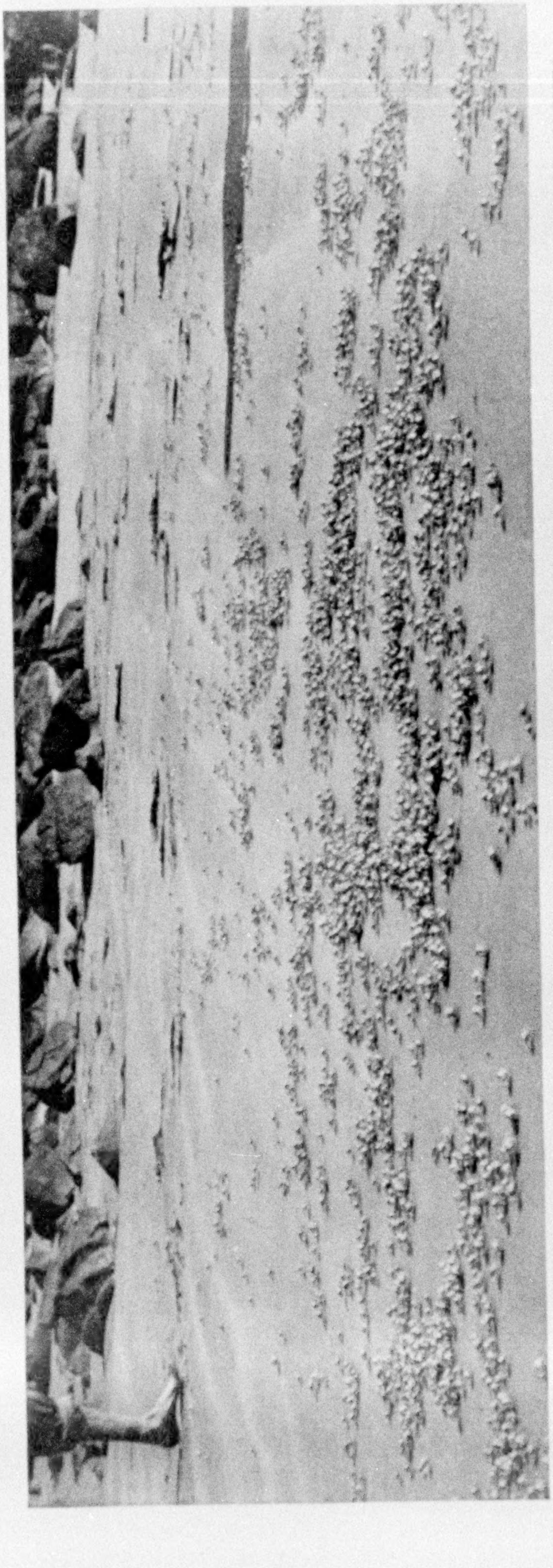
SOLDIER CRABS: THEY USUALLY GATHER IN MASS FORMATION AND WILL ATTACK IF HARD PRESSED (SEE TEXT, PAGES 329 AND 330)

AN AUSTRALIAN ABORIGINAL WITH SEA HAWK'S EGGS

This black boy, whose splendid physique has surprised all those who are familiar with the build of the Australian aborigines, climbed this cliff with utmost ease and robbed the great beaconlike nest.



FORREST RIVER ABORIGINES WITH THEIR THROWING STICKS, OR WOMERAHS (SEE TEXT, PAGE 356)



CRABS AT CHILLI CREEK. MILLIONS OF THESE TINY CREATURES, THE SIZE OF A 50-CENT PIECE, SWARM ALONG THE BEACHES

in length and weighed nearly 600 pounds.

Butcher Inlet provides another remarkable illustration of the power of the tides on the northwest coast, as fifty miles inland the rise and fall is 18 feet, while at the entrance the fluctuation is 30 feet.

A terrific conflict takes place at the turn of tide, when the outgoing waters meet the incoming sea, the effect being to swing a craft at anchor in the inlet backward and forward like the pendulum of a clock. It is near here that the Charnley River pours out its waters.

NAVIGATING A CROCODILE-INFESTED RIVER

A run up this stream provides plenty of excitement, as here and there great mud-covered alligators, with which the waters swarm, slide down the banks. The black boys, with Stuart in the motorboat, took care to stick close to the craft, as these reptiles rose near the boat, seeming to resent its passage.

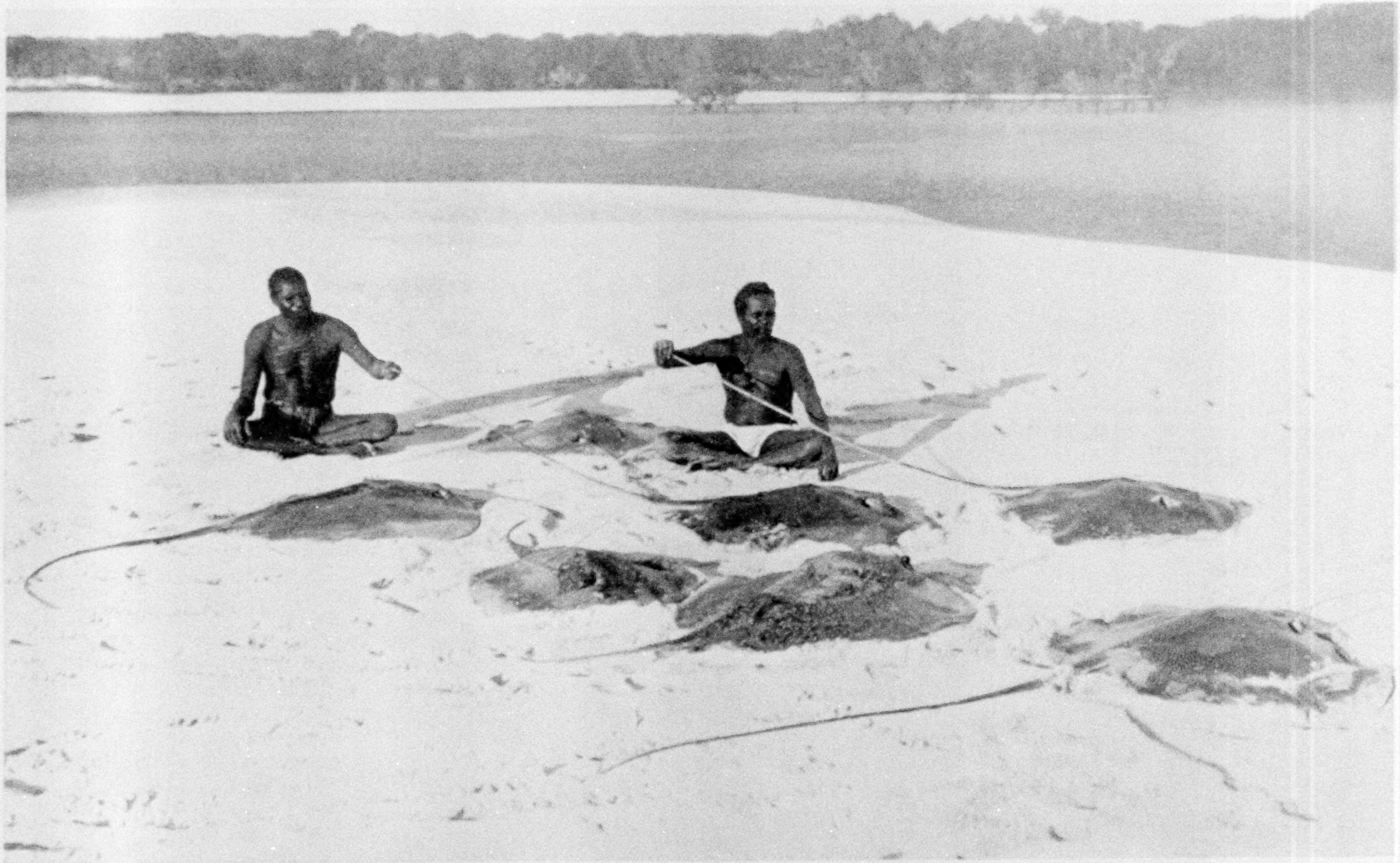
The country is timbered and ranges of hills nearly enclose the river.

At almost any point on the coast, dugong can be speared, while a sailfish—a species of fish with a large sail-like fin, which is raised when its owner is on the surface of the water—was captured by E. J. Stuart. It was beautifully colored and measured 8 feet in length, its sail covering an area of six square feet when fully extended.

Another strange creature is the sucker fish, or shark sucker, which clings to larger fish and to hulls of vessels by means of ridges or "vacuum cups" at the back of its head, solely for the purpose of "stealing a ride"—a veritable hobo of the sea.

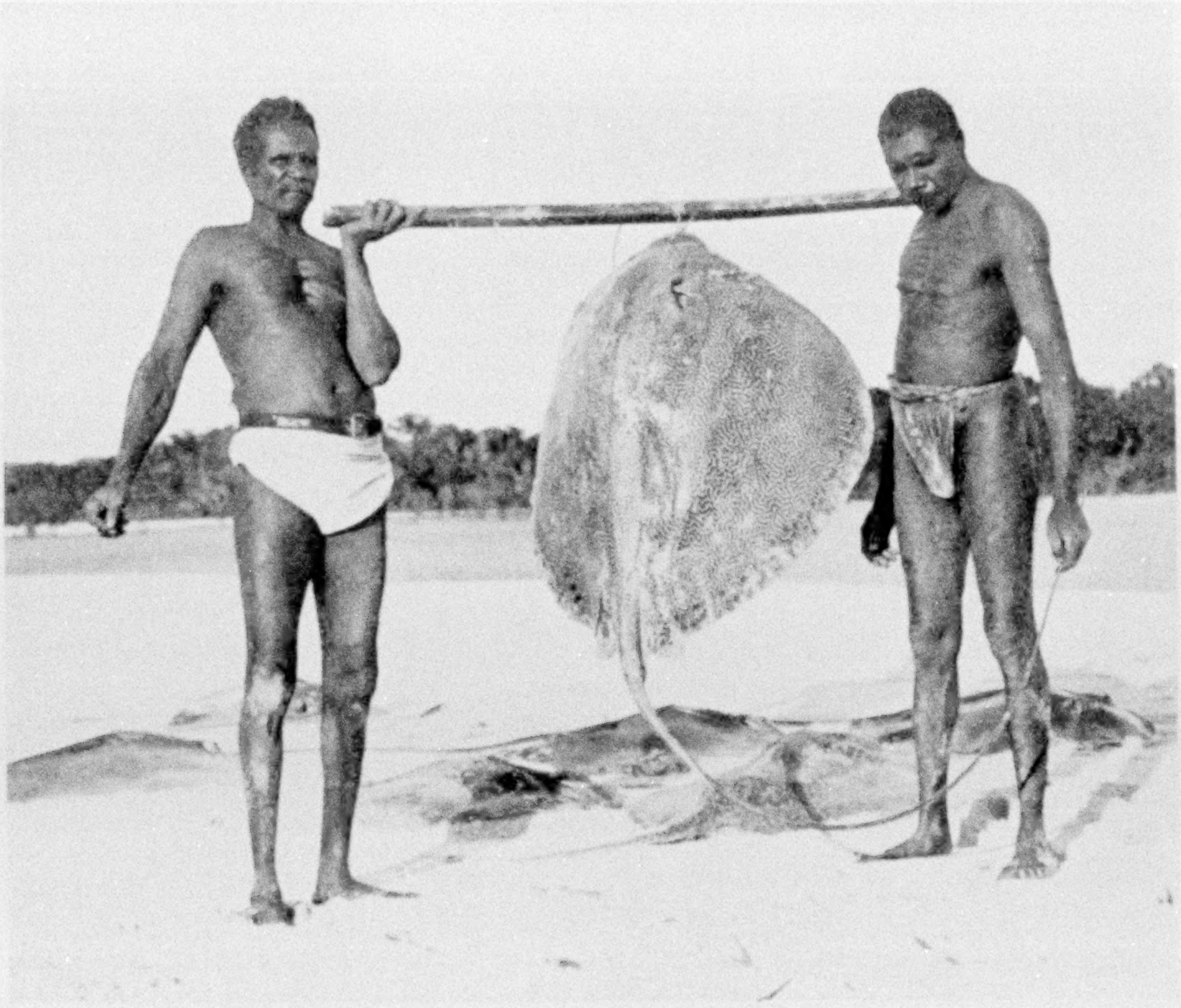
PHOTOGRAPHIC RECORDS OF CORAL FORMATIONS OBTAINED

Montgomery Island is one of several small bits of land dotted



SEVEN STINGRAYS SPEARED BY SUNDAY ISLANDERS AT NAPIER BROOME BAY

A sting from one of these rays has been known to cause death. Quite recently a fisherman near Sydney was stung by one about the size of a dinner plate and a finger had to be amputated.



TWO NATIVE MEMBERS OF THE NOR' WEST SCIENTIFIC EXPEDITION DISPLAYING A 400-POUND STINGRAY

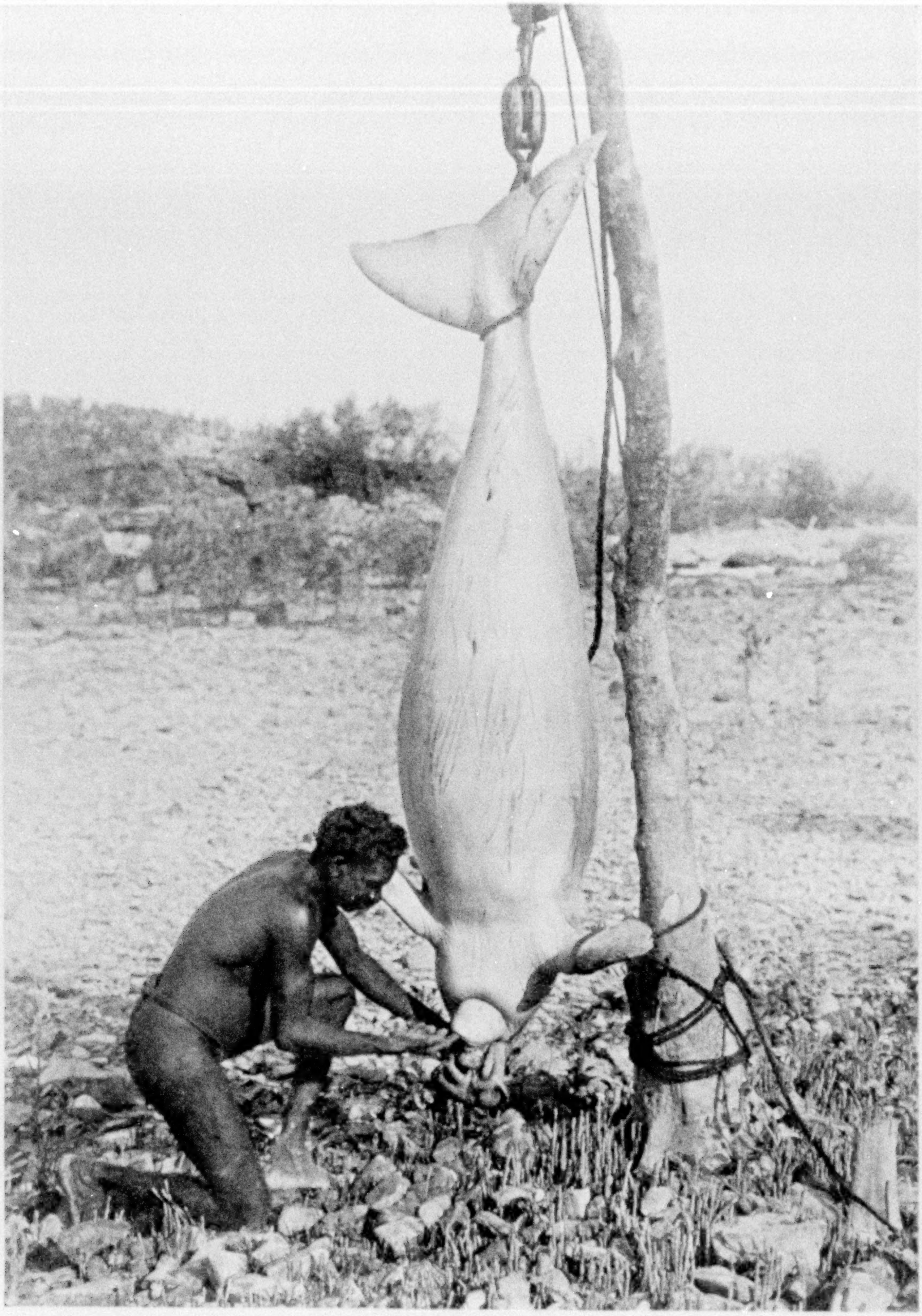
These giant blacks, both standing close on 7 feet, speared the monster in the shallow waters of the northwest coast of Australia. The poisonous stinger, which is actually an extension of the spine, projects about two feet down from the thick part of the tail, and this is used as a means of offense and defense. Stingrays up to 600 pounds have been caught on this coast.

among the dangerous coral reefs which strew the coast for miles north of Butcher Inlet. One reef has an area of 20 square miles and is completely covered at high tide, but when the turn comes the sea rushes from the reef like a waterfall, eventually leaving it high and dry.

EACH BLACK CARRIES HIS "VISITING CARD" ON HIS BODY

Stuart got all hands to cut and blast a channel through this reef, allowing the water in one of the lagoons to drain away. This enabled Jackson to photograph the sides of the lagoon from the dingy, which was carried over the reef and placed on the water left in the miniature lake. He obtained an excellent record of coral formations (see page 333).

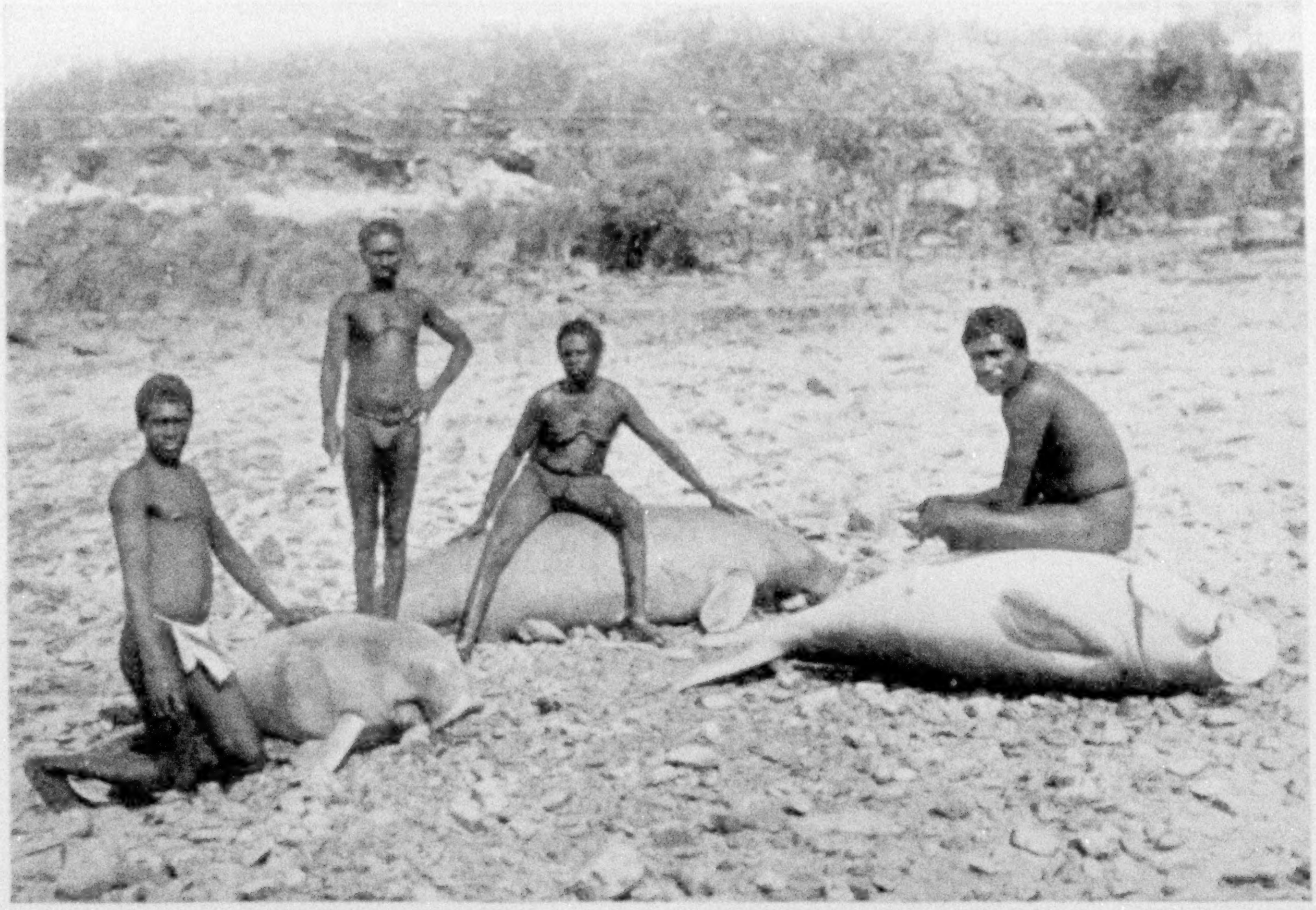
On the adjacent Montgomery Island the blacks are noted for the remarkable way they ornament their bodies by means of cicatrices. Their markings are said to be the most unusual in Australia. The skin is cut with a sharp shell, and mud, obtained from around the roots of the mangrove scrub which grows in the salt water, is then rubbed repeatedly into the wound. Tribal marks are made thus, and each man carries his visiting card on his



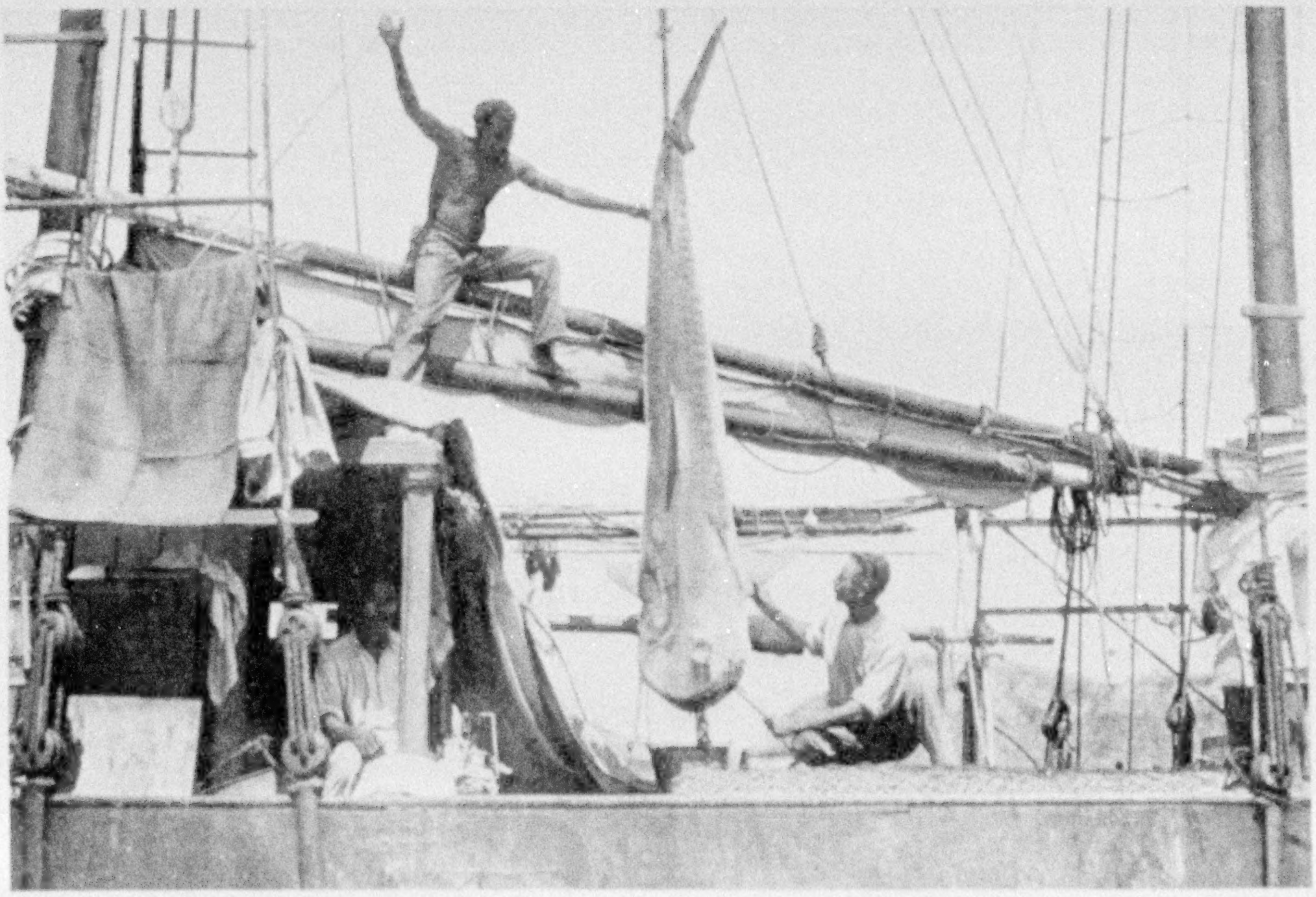
A GIANT DUGONG; LENGTH, 12 FEET; WEIGHT, ABOUT 600 POUNDS

The flesh of the dugong is eaten by whites and blacks alike. It is a mammal and is hunted like the whale. The dugong holds its young to its breast and suckles it; hence the tradition that it is the original "mermaid."

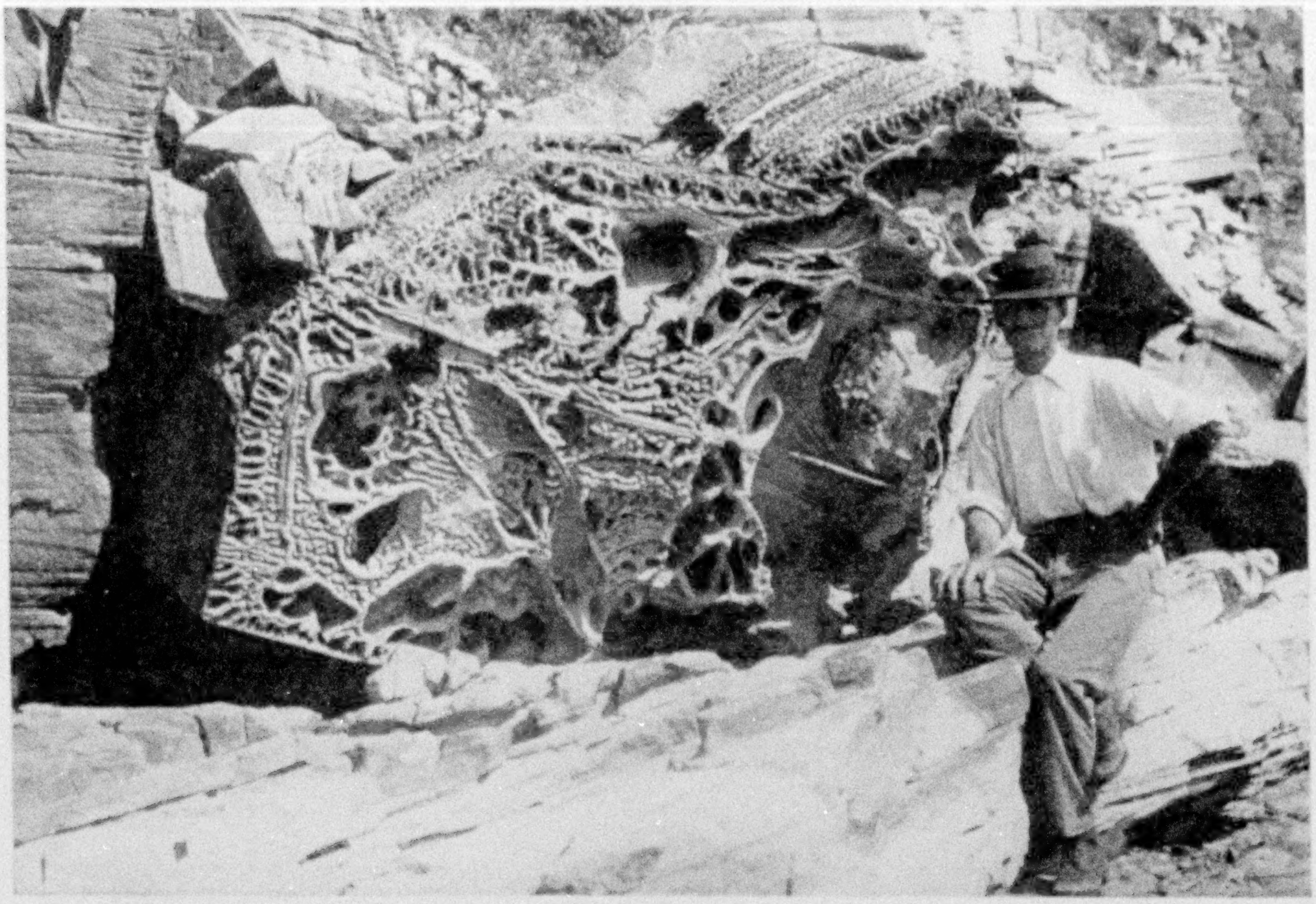
XUM



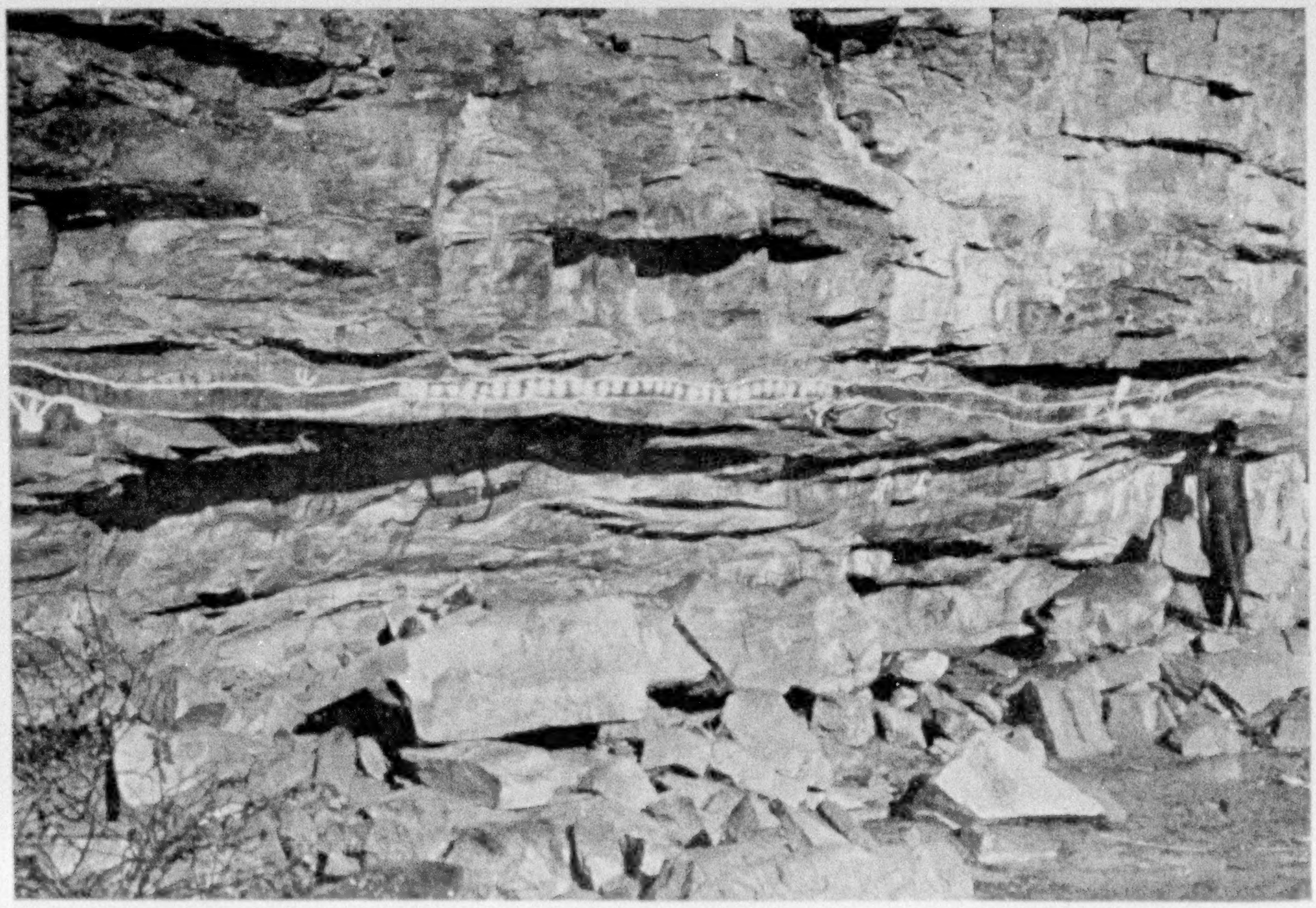
DUGONGS, OR SEA COWS, CAPTURED AT DUGONG BAY



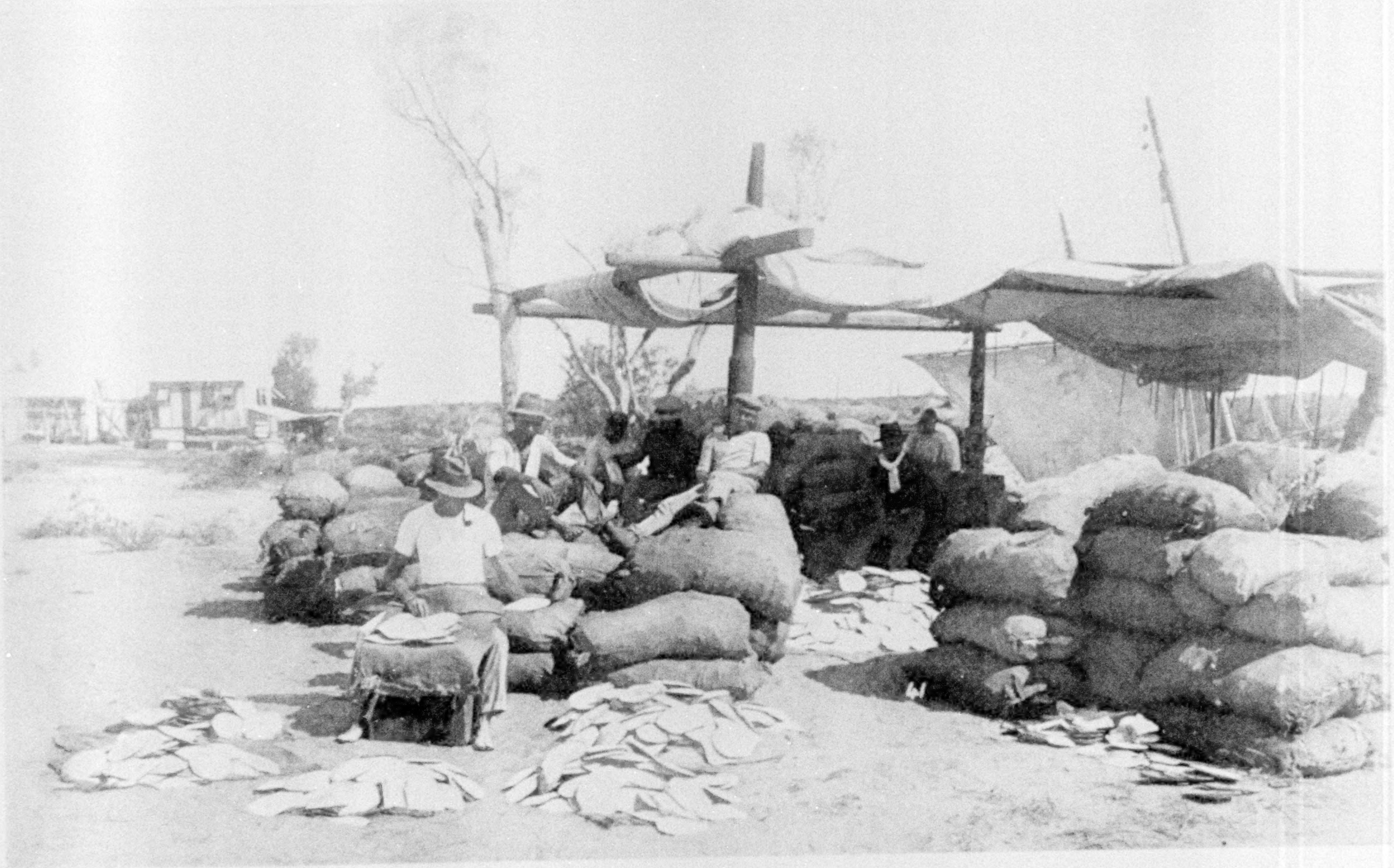
A 14-FOOT MAN-EATING SHARK WHICH PROVIDED A RARE FEAST FOR THE MALAY CREW OF THE "CULWULLA"



WAVE-FRETTED ROCK IN CAMBRIDGE GULF

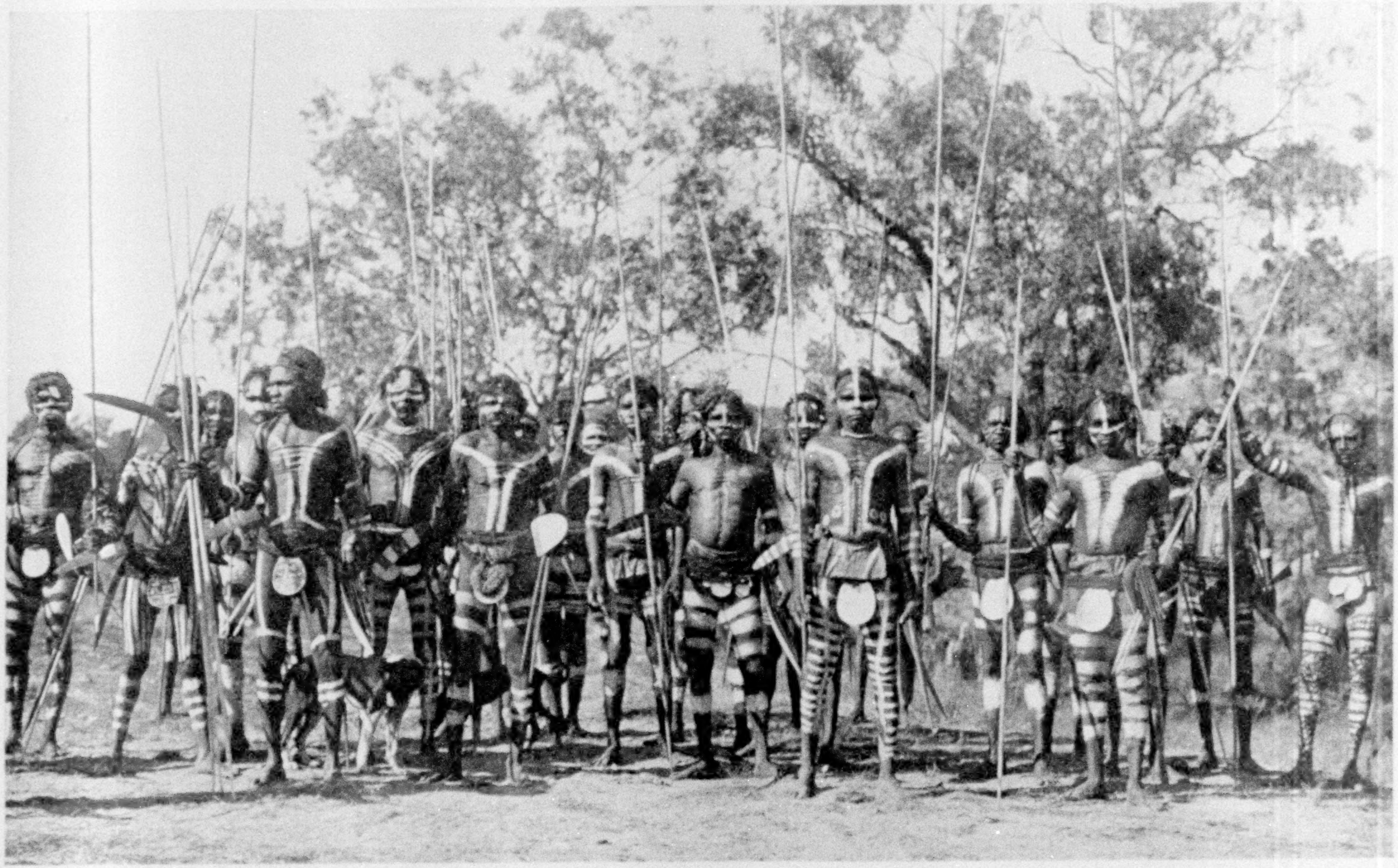


ROCK DRAWINGS IN THE FORREST RIVER DISTRICT WITHIN WALKING DISTANCE OF THE FORREST RIVER MISSION STATION



SORTING MOTHER-OF-PEARL SHELL

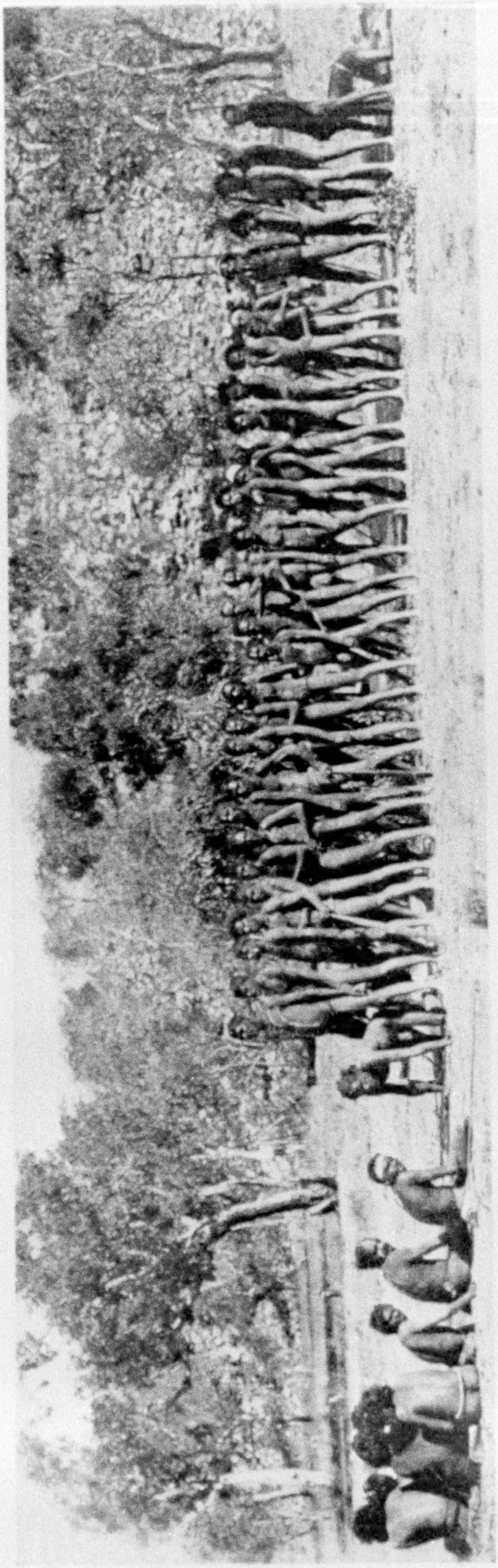
The pearl shell fished from the sea along the West Australian coast has brought up to $1,500 per ton, but of late years there has been a great fall in price—a drop of $750 on one occasion. Here the shells are being classed and thrown into several heaps. In the London market they are sold in five divisions, known as bold, medium, chicken, broken pieces, and wormy.



A TRIBE OF WEST AUSTRALIAN BLACKS ARMED WITH SPEARS, SHIELDS, AND BOOMERANGS

Their bodies are daubed with white clay; they often use red and yellow ocher. Many of the spears in this picture are 14 feet long.

XUM



THE CORROBOREE, A NATIVE CEREMONIAL DANCE

The Australian blacks have all kinds of ceremonies, some of a serious nature and others a matter of entertainment. They usually imitate the actions of animals and birds. Here they are performing an alligator dance. The figures squatting on the ground form the "ladies' orchestra." They keep time to the movements of the men by beating on their thighs, clapping hands, and sometimes striking the folded skins of animals, such as kangaroo or wallaby hide.

body. On the islands along this coast the practice has developed into a craze for so-called beautification of the body. The ridges are quite soft and velvety to the touch. The operation of surgical ornamentation of the men is often performed by the wives.

Some excellent pioneer work is being accomplished at Port George Mission by Messrs. Wilson and Paton, who, with their wives, have produced a veritable Garden of Eden, with tropical fruits, flowers, and vegetables. They have many goats and fowls. The surrounding country is well grassed and fed by fresh running streams.

The blacks in this section are reputed to be a quarrelsome lot, but Mr. Wilson reports that the quarrels are tribal affairs and he has never been molested. These aborigines carry a distinct strain of Malay blood, which is the case with many tribes on the northern coast of Australia, as Malays have frequented the northern seaboard for centuries in search of pearl shell and sea slugs (trepang), which find a ready sale in markets of the Far East.

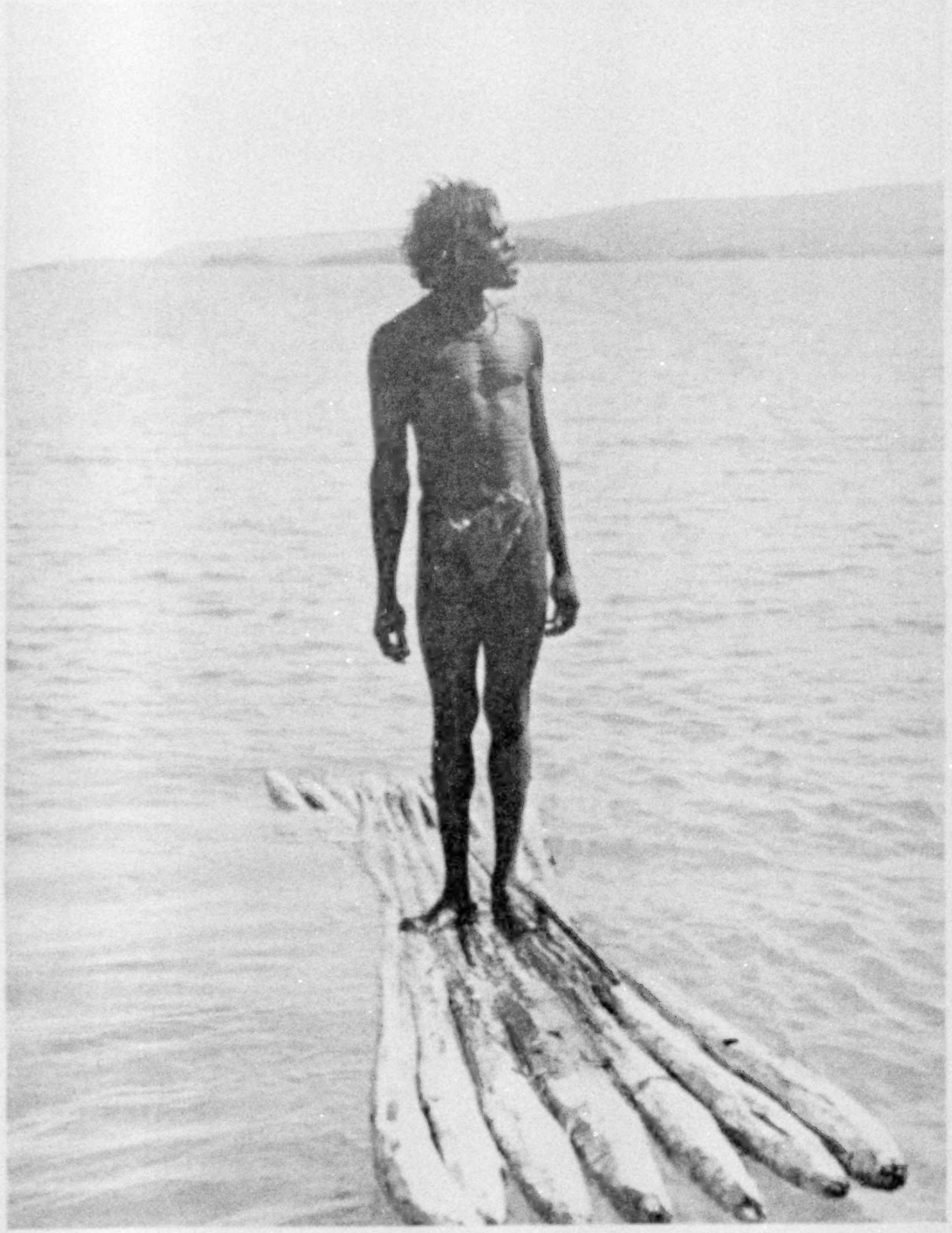
Sea snakes are frequently seen curled up asleep on the surface of the water. These reptiles are poisonous and grow to about 12 feet in length.

The run from Admiralty Gulf to Napier Broome Bay is full of navigation difficulties, since many reefs and small islands abound.

NATIVES OF LONG ISLAND GROW HOSTILE

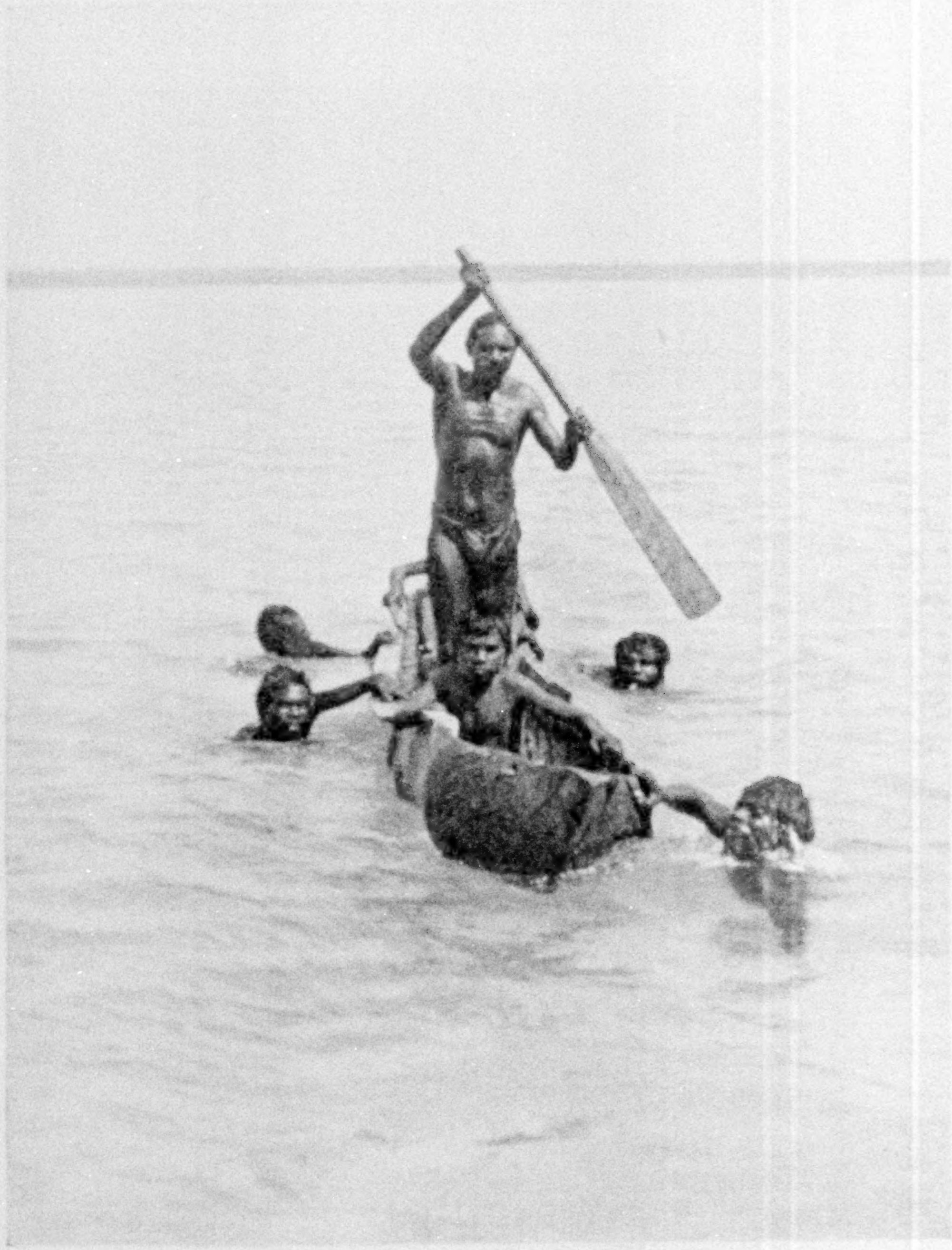
At Long Island several wild men were induced to come aboard the schooner. They were very tall and wore no clothing whatsoever, their only adornment being well-defined

XUM



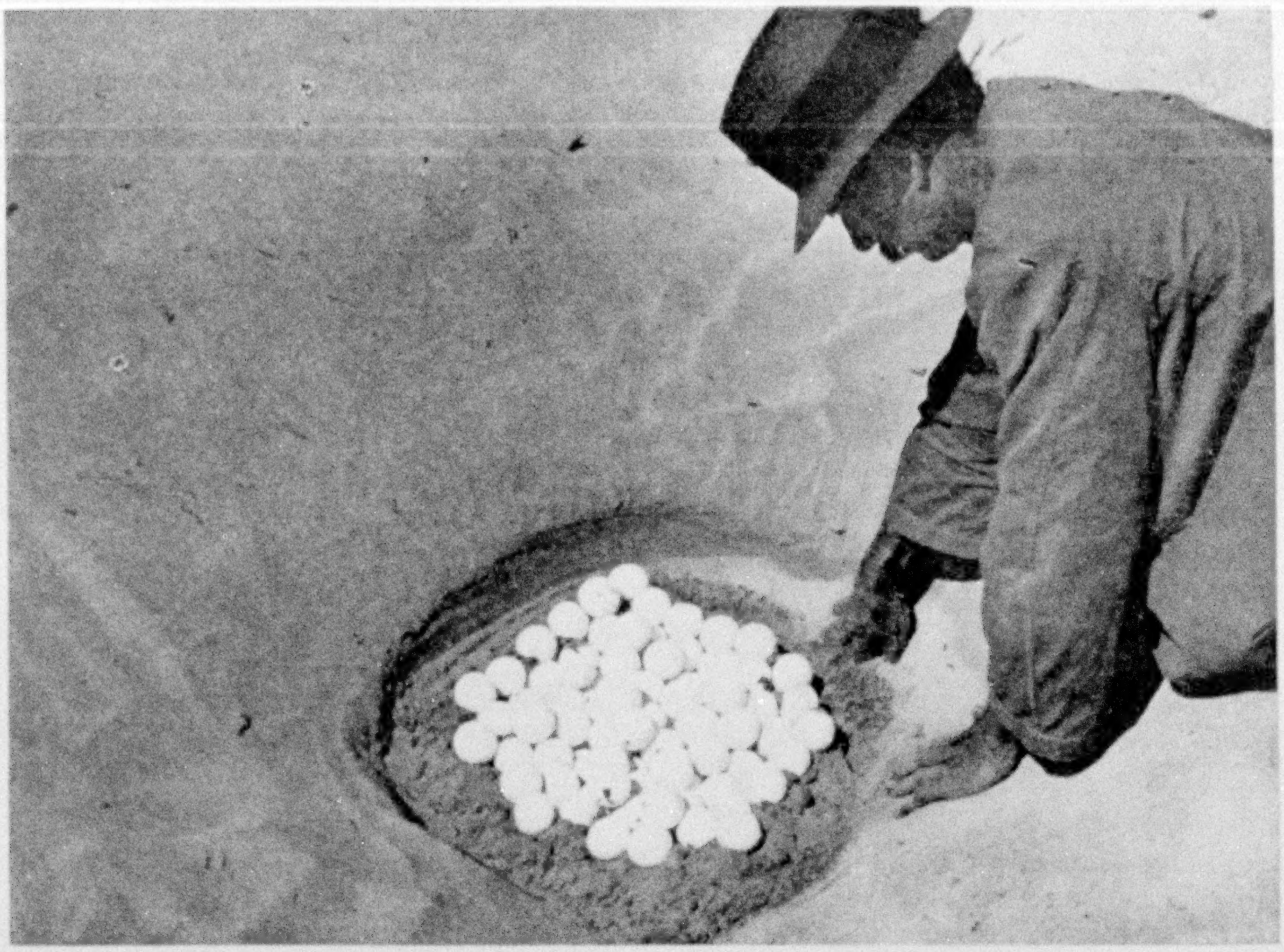
"SAMSON"

A wild inhabitant of Camden Sound, Western Australia, who has won a reputation far and wide as a wonderful spear-thrower and a terrible fighter. Within the last few months news has filtered down the coast that he has killed three men. He is standing on a raft built of mangrove saplings which are held together by hardwood pegs.



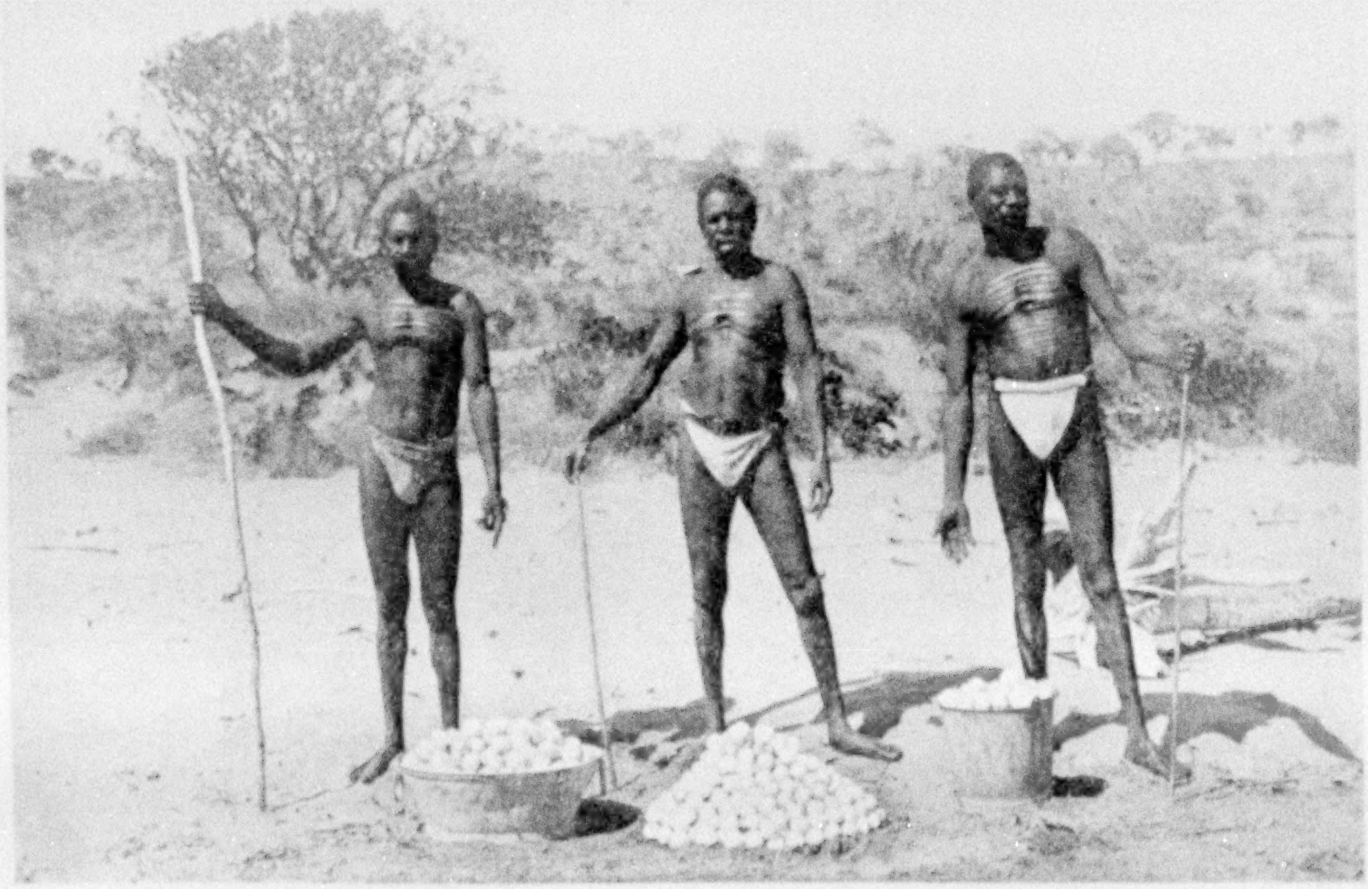
AN AUSTRALIAN DUGOUT

This rough craft is the result of burning and chopping out a solid log and pointing each end. It is 19 feet 6 inches long and has a beam of 18 inches. Though it is filled and surrounded with Montgomery Islanders, it was actually captured from a wild tribe which inhabits one of the many small islands on the northwest coast of Western Australia.

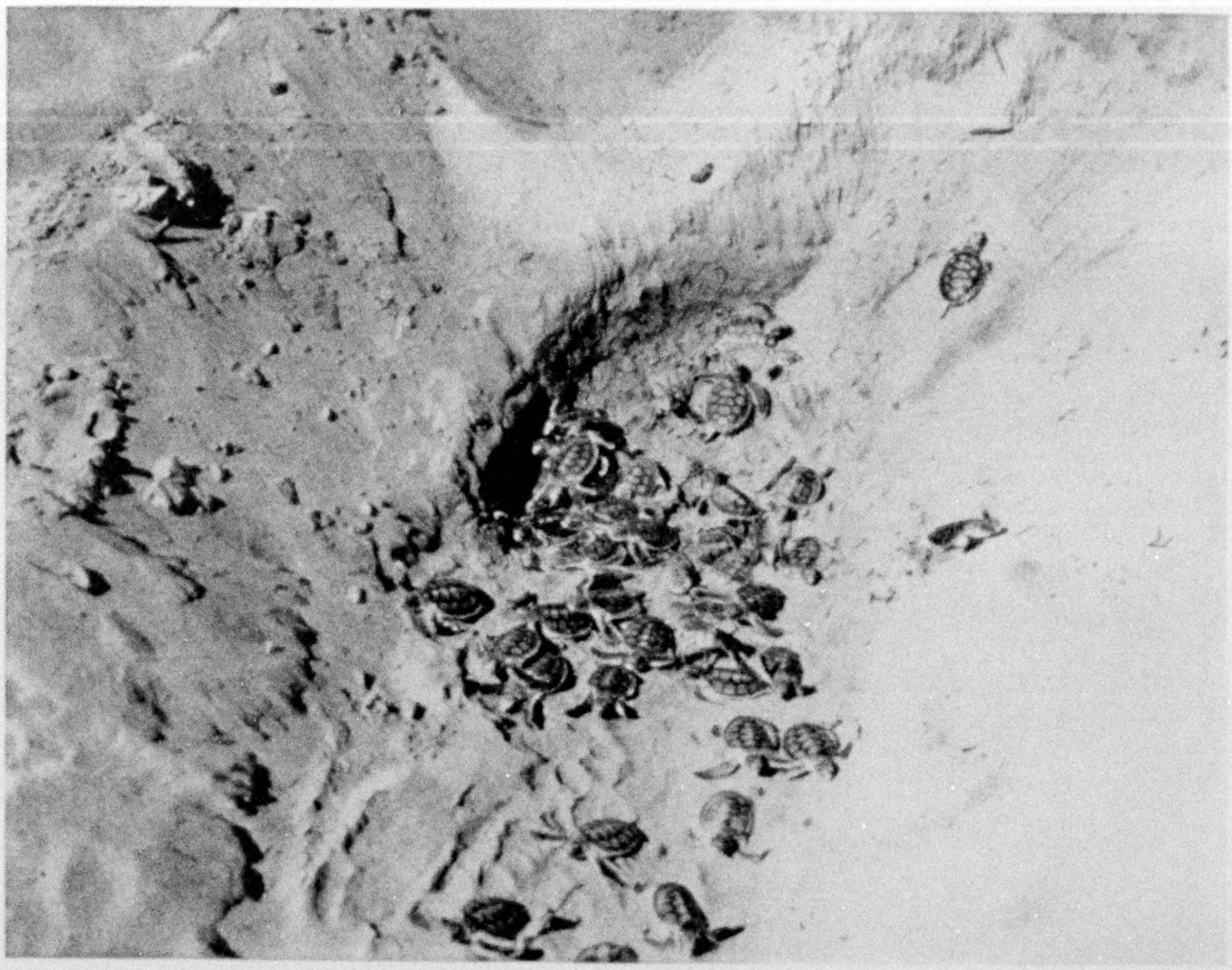


A TURTLE NEST; THESE EGGS ARE ABOUT THE SIZE OF TENNIS BALLS

Unlike the hen egg, they have a parchmentlike covering. As many as 200 eggs have been found in one nest. The natives find these nests by probing the sand with spears or sticks, the stain on a spear point indicating the incubator. The eggs are eaten raw by the blacks and are used in cooking by the whites of tropical Australia.

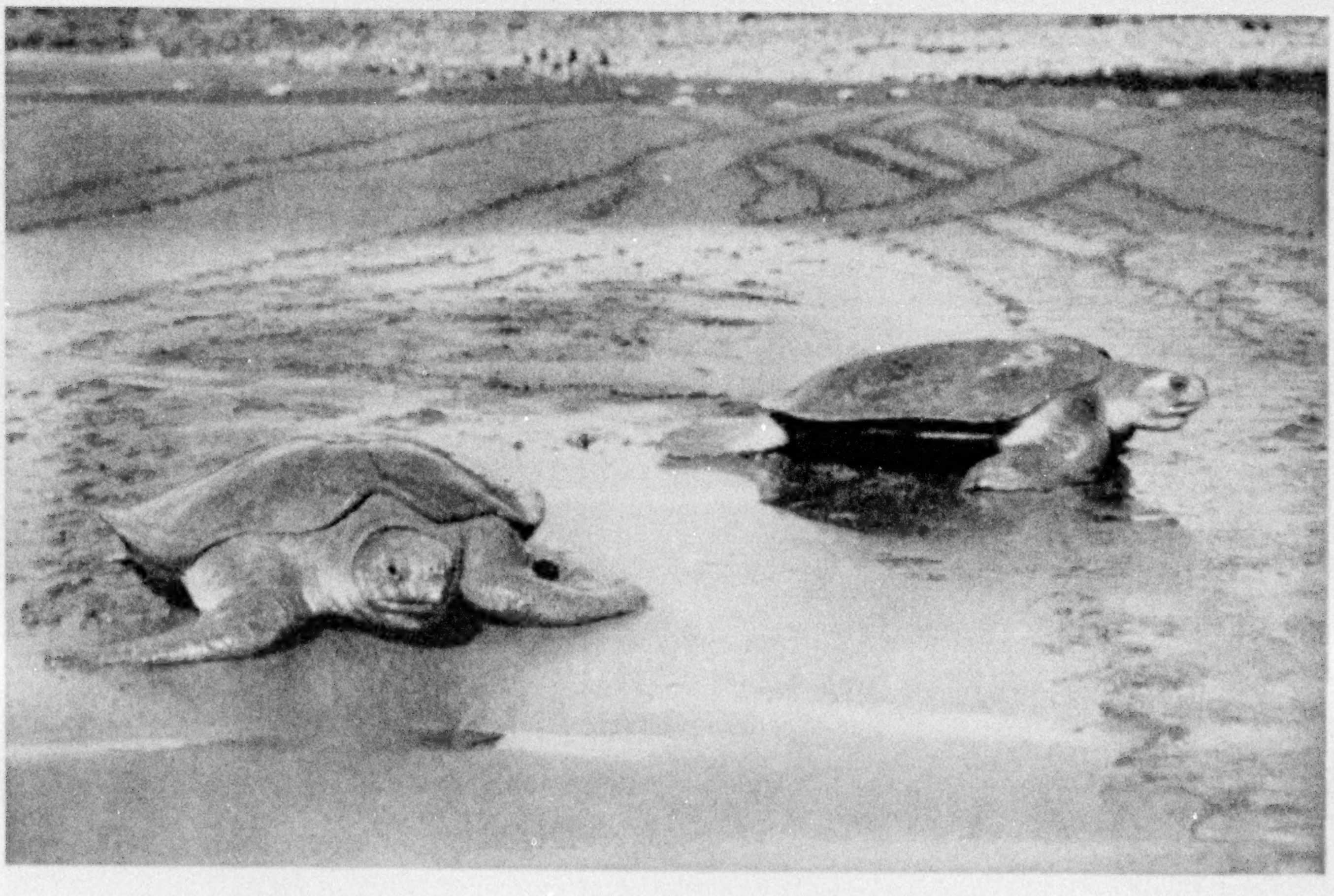


GIANT BLACKS WITH TURTLE EGGS

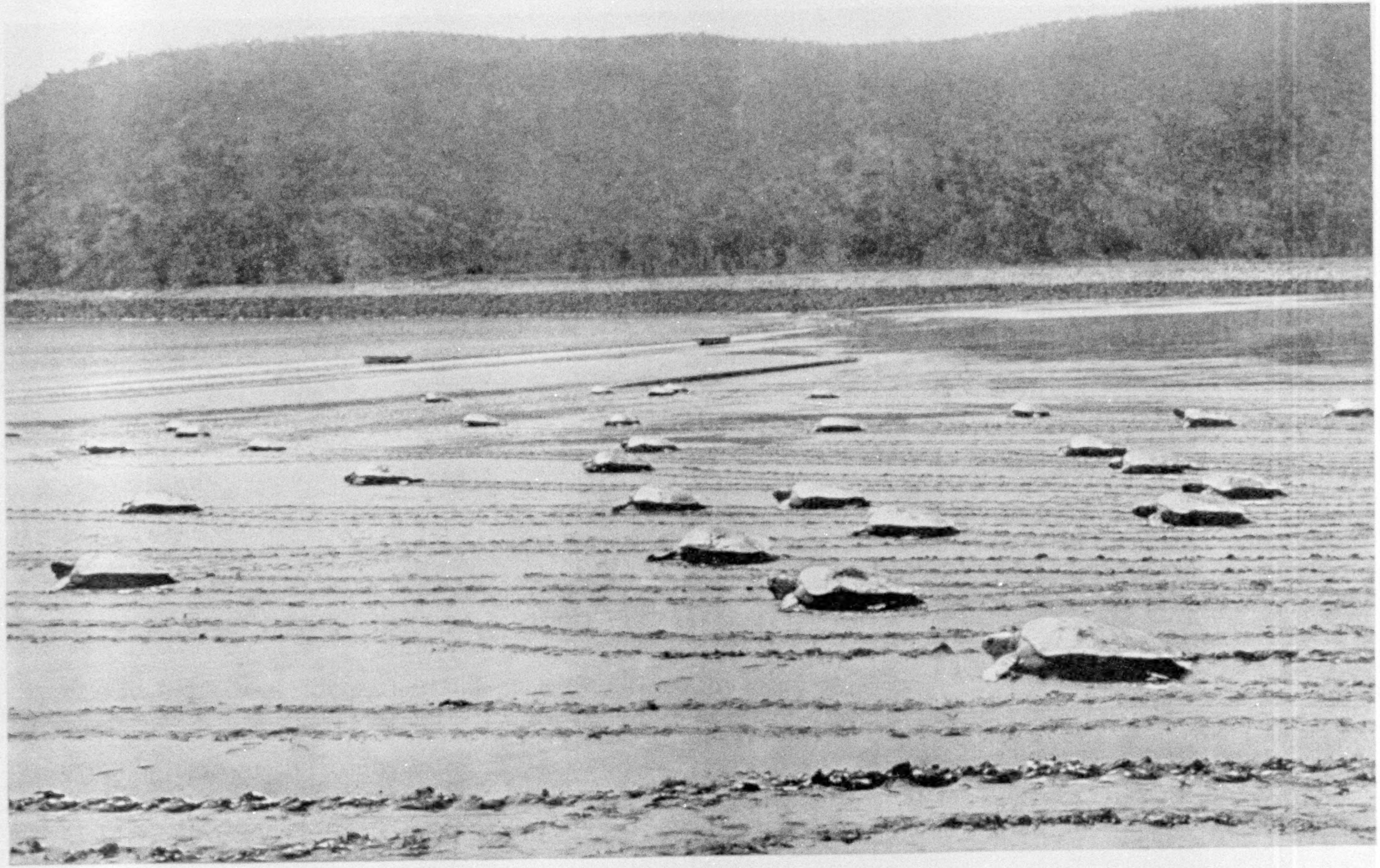


A NEST OF YOUNG TURTLES

When the eggs, which have been buried about two feet deep by the mother turtle, are hatched in the warm, dry sand, the little turtles fight their way upward and, once on the surface, make straight for the sea. Here the youngsters, measuring about three inches, are starting on their first expedition down to the sea.

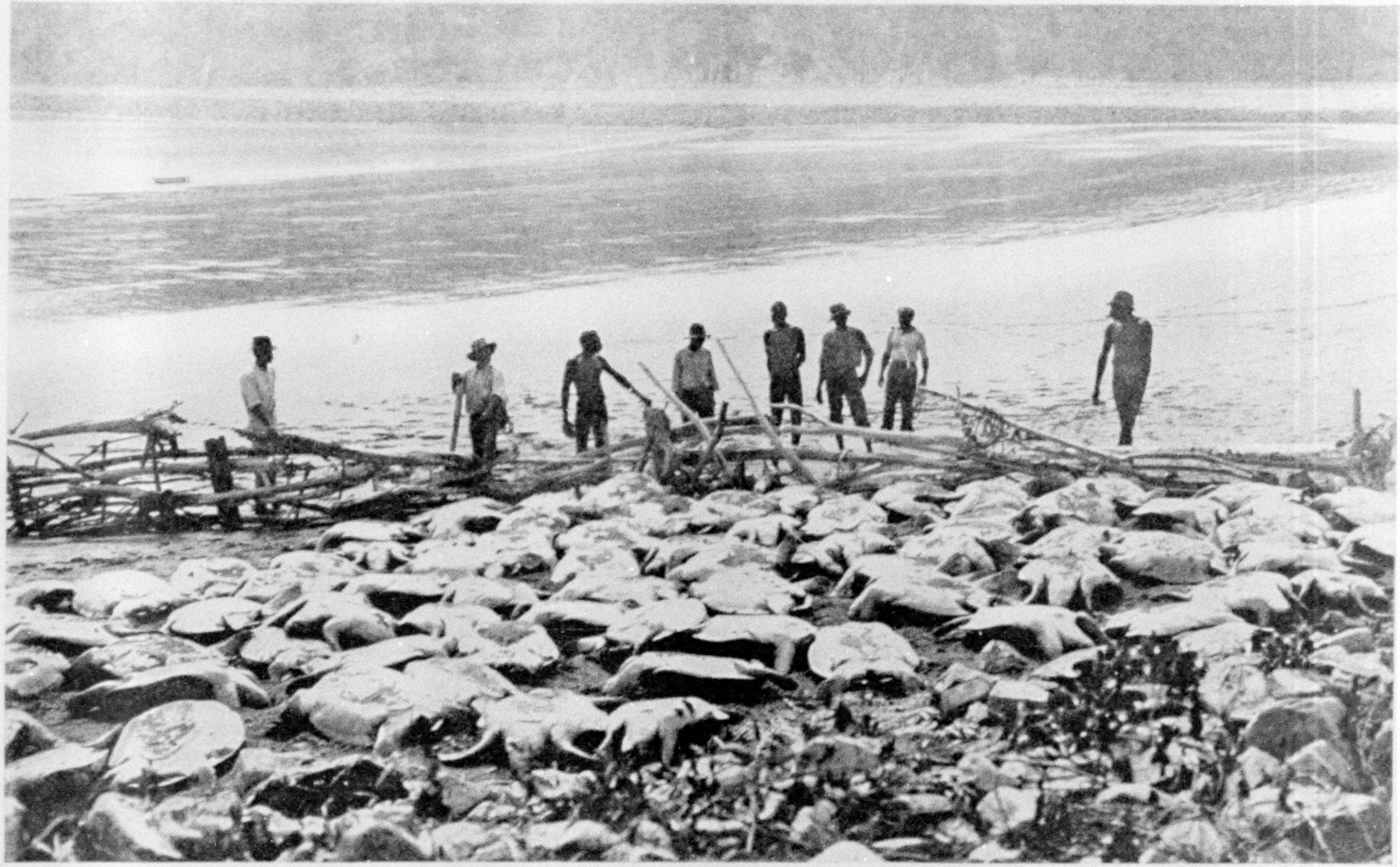


TURTLES ON LACROSSE ISLAND, CAMBRIDGE GULF



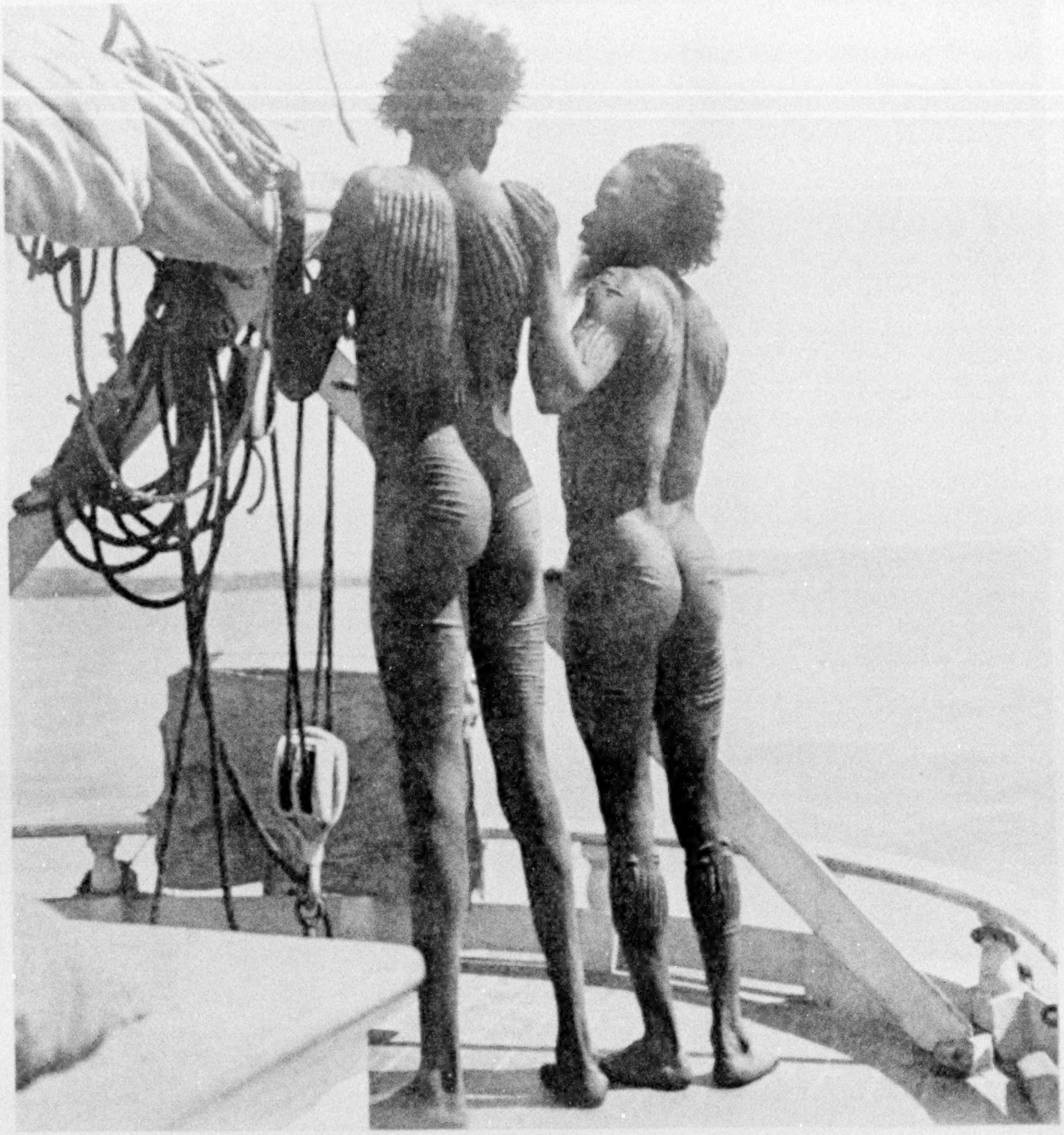
FEMALE TURTLES MOVING TO THE SEA, AFTER BEING HELD PRISONERS ALL NIGHT

As they march they leave their "footprints" on the sands.



A RECORD TURTLE CATCH ON LACROSSE ISLAND

Four Sunday Island blacks captured 83 giant turtles on the beach at Lacrosse Island, in the Cambridge Gulf. They were caught at night, as they left the water to go ashore to lay their eggs.



AS WILD AS THE WORLD'S WILDEST

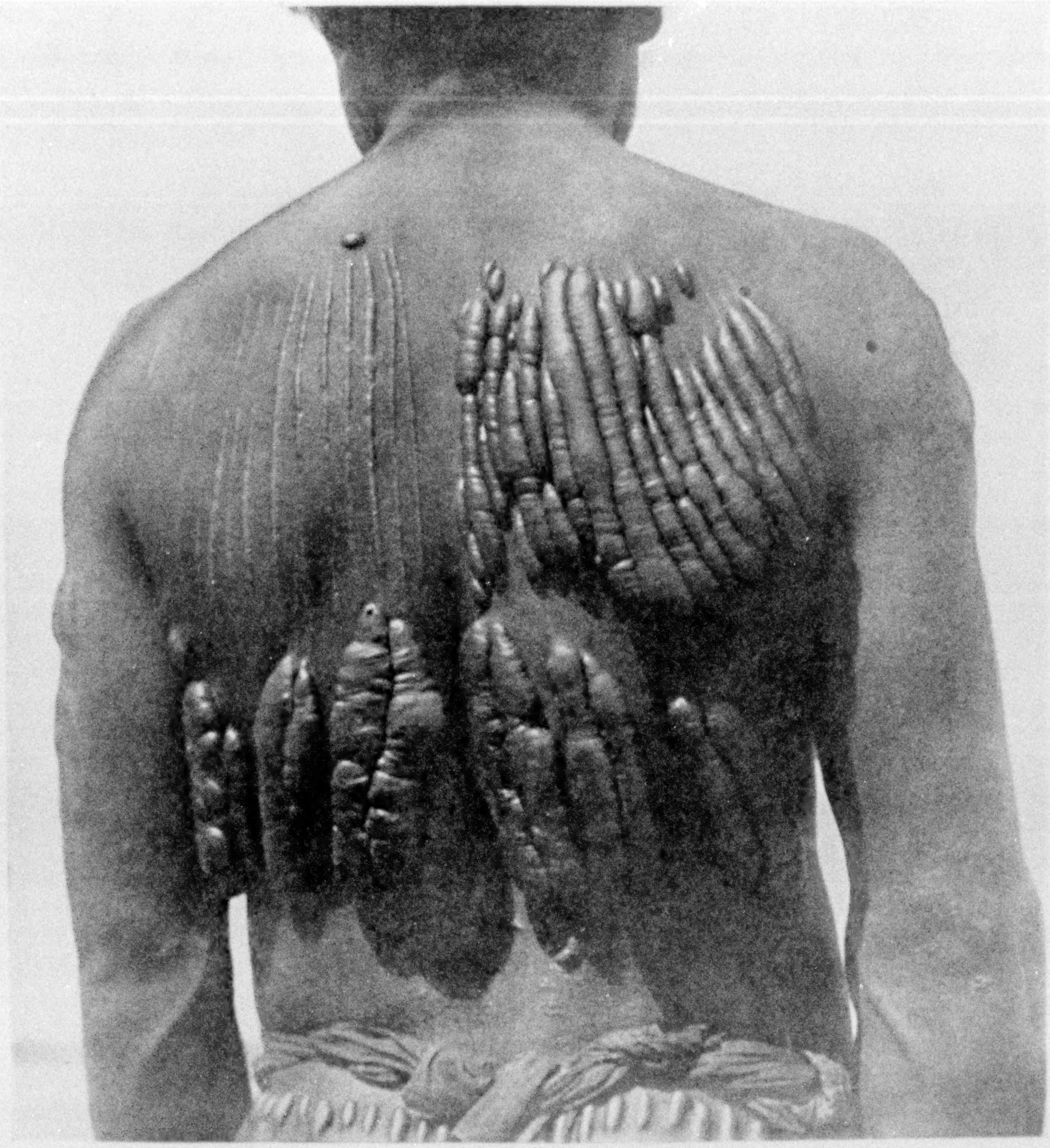
These inhabitants of a small island on the northwest coast of Western Australia live entirely in the open, build no huts, and when first approached by white men dashed into the scrub, later appearing armed with spears.

tribal markings and long chin whiskers. All conversation was carried on by means of signs, as even the blacks of our party could not make themselves understood.

Later, when nearly all hands went ashore, the attitude of the Long Islanders changed from one of friendliness to threatening hostility. They flourished their spears and seemed ready to attack. The Sunday Island boys explained that this change took place because their offer of women was neither appreciated nor accepted.

On the shores of Napier Broome Bay there is a small mission station, founded some 20 years ago by Spaniards of the same order which founded Beagle Bay Station.

It is rarely that a white visitor plants his feet in these parts, except about once a year, when the mission schooner brings supplies from Broome. Rice, tobacco, sugar, and tropical fruits are grown with success by the four Brothers. Eight half-caste boys, an old black fellow, and a gin constitute the entire population.



A MONTGOMERY ISLANDER'S ORNAMENTED BACK

This remarkable design is brought about by opening up the skin with a sharp shell and constantly rubbing in mud obtained from around the roots of the mangrove trees, which grow in salt water and fringe the coast of tropical Australia. It is said that this particular aboriginal has the finest body ornamentation on the Australian continent.

The Brothers are often attacked by hostile blacks, and two of them bear the marks of spear wounds received in these encounters. Wild dogs — dingoes — also trouble the little settlement.

Several great stingrays and a shovel-nosed shark were speared in the shallow waters of the bay. The stingray, sometimes reaching a weight of 600 pounds, is armed with a poisonous spear which protrudes from its thick tail, not quite halfway down. This spear is an extension of its spine and is used as a weapon of offense and defense. The sharks on this coast grow to an enormous size, often attaining a length of 30 feet.

THE ISLAND HOME OF GIANT TURTLES

In Cambridge Gulf, a small uninhabited island, known as Lacrosse, is the home of giant turtles. Here, in one night, the four Sunday Island boys captured 83 great turtles by turning them over on their backs. Every turtle was capable of

XUM

carrying a man, a feat which was proved when one of the biggest blacks of the party mounted and rode his turtle toward the sea. After reaching the water the turtle actually supported the man, who prevented it from diving by holding firmly to the front part of its shell and by throwing his weight on the tail end. Jackson obtained a splendid record of turtle life.

RANCHES SERVED BY CAMEL TRAINS

At the head of the gulf lies Wyndham, the port for the great cattle country of the hinterland. From Wyndham the cattle stations (ranches) are served by camel trains, which carry supplies for hundreds of miles into the interior. The camels are driven by Afghans. Camel teams are familiar sights in the streets of the little township, hauling in the great wagon-loads of firewood from the outlying district.

The first camels were brought to Australia for the use of the early explorers. Later a fine type of dromedary was imported for breeding purposes and it is this type of animal that is bred in central Australia. It is considered by many leading authorities to be the largest and strongest dromedary to be found in the world. It proves invaluable for pack work in waterless regions.

Wyndham is a typical Australian outback town—it boasts a hotel, hospital, butcher's shop, several stores, post office, and savings bank. The Western Australia Government has built a fine refrigerating plant here, and when in full swing it should give Wyndham an impetus.

On the Forrest River, which flows into Cambridge Gulf, Mr. and Mrs. Gribble are living at the Anglican Mission, founded for the uplift of the Forrest River tribes. Mr. Gribble has numbers of loofa vines growing, which provide a substitute for sea sponges. He ships his loofa sponges at Wyndham, whence they are taken to Perth.

Unlike many of the tribes to the south, who use the spear in the same manner that the ancient Greeks threw their javelins, the Forrest River men use a throwing-stick, or lever, known as a *womerah*.

By resting the spear on this flat lever, which measures about three feet in length, such an impetus is given to the throw that a good spear-thrower can hurl the weapon as many yards as he can throw it feet when hurling it javelin-fashion.

It is generally believed that every Australian black throws the boomerang, that peculiar curved stick so closely identified with the aborigines, but such is not the case. There are tribes which have never seen a boomerang. The blacks of this coast are particularly well set-up and well nourished types, hundreds of them standing nearly seven feet in height.

The trip from Broome to Wyndham and return required six months of strenuous work and navigation in the *Culwulla*. The expedition obtained much valuable information regarding the pastoral, fisheries, timber, and mineral wealth of this wonderland of the State. William Jackson secured the first comprehensive pictorial record by means of the "movie" and still cameras.

IMPORTANT NOTICE TO MEMBERS

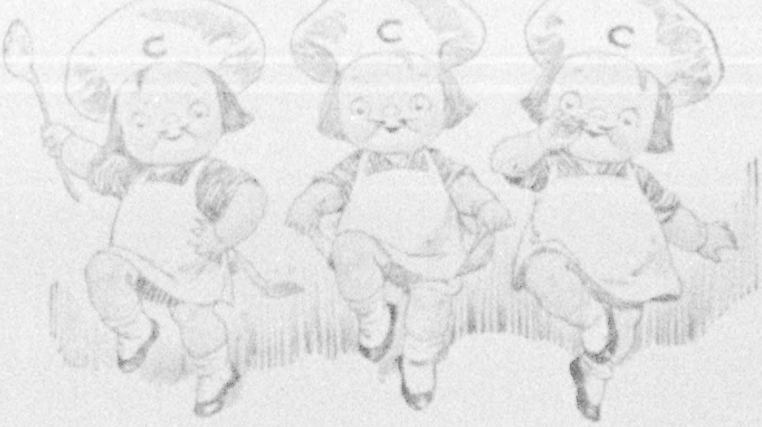
Those authorized to secure detailed information and photographs in the name of the National Geographic Society and its Magazine are supplied with official credentials in the form of letters specifying the object in view. Upon presentation of such identification, the fullest co-operation is respectfully requested.

This notice to the members is necessary, unfortunately, because of the fraudulent operations of unauthorized persons claiming official connection with The Society or the Magazine.

All membership fees should be made payable to the National Geographic Society.

SOUP MAKES THE WHOLE MEAL TASTE BETTER

We blend our soups with glee.
We have the French "espree,"
The delicate touch
That means so much—
Taste Campbell's cookery!



but taste Vegetable Soup as our French chefs make it!

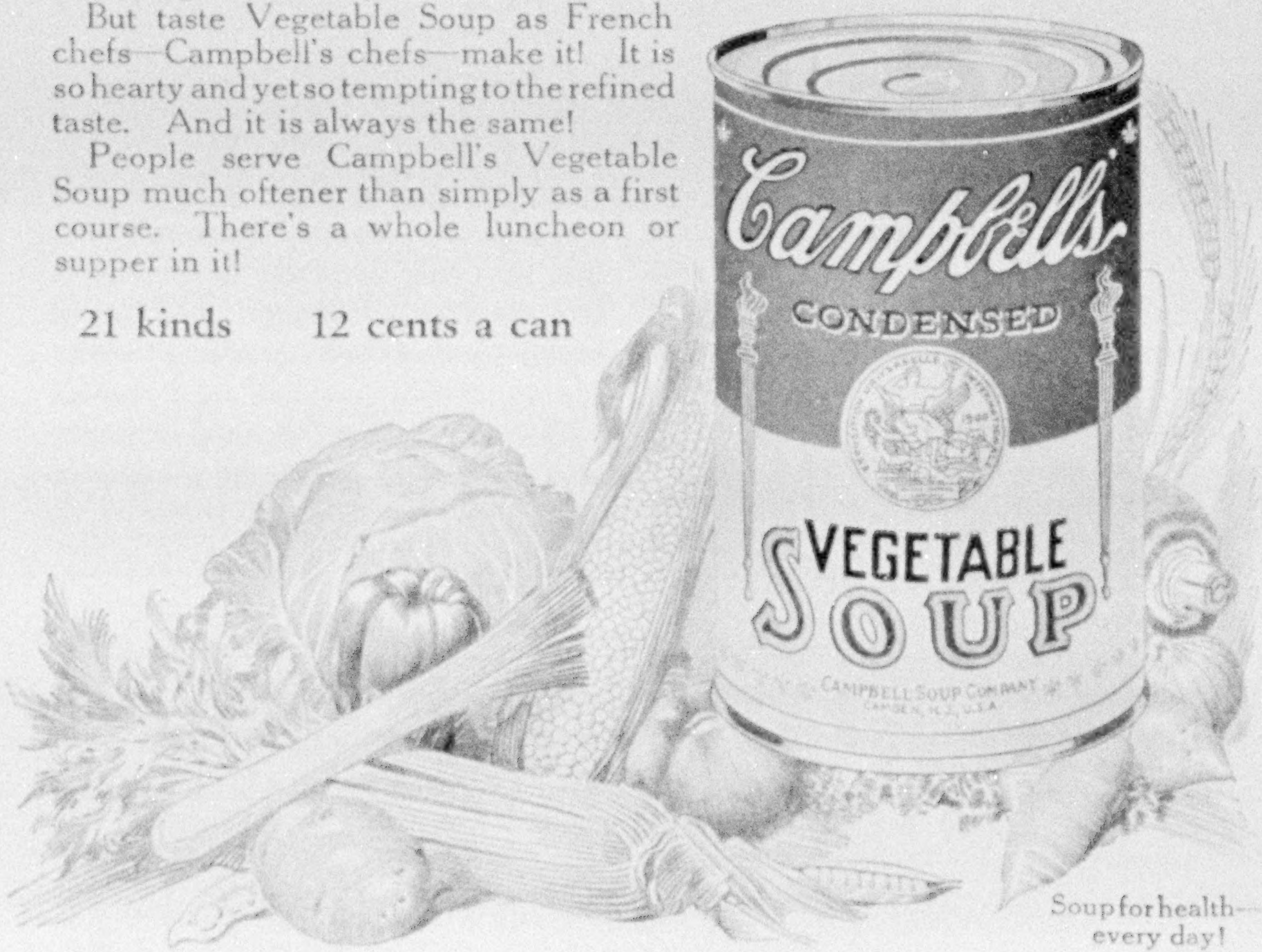
No doubt really good vegetable soup is one of your favorites—it is so substantial and nourishing.

You know how difficult it is not to vary the ingredients—you are never quite sure of having the blend you like.

But taste Vegetable Soup as French chefs—Campbell's chefs—make it! It is so hearty and yet so tempting to the refined taste. And it is always the same!

People serve Campbell's Vegetable Soup much oftener than simply as a first course. There's a whole luncheon or supper in it!

21 kinds 12 cents a can

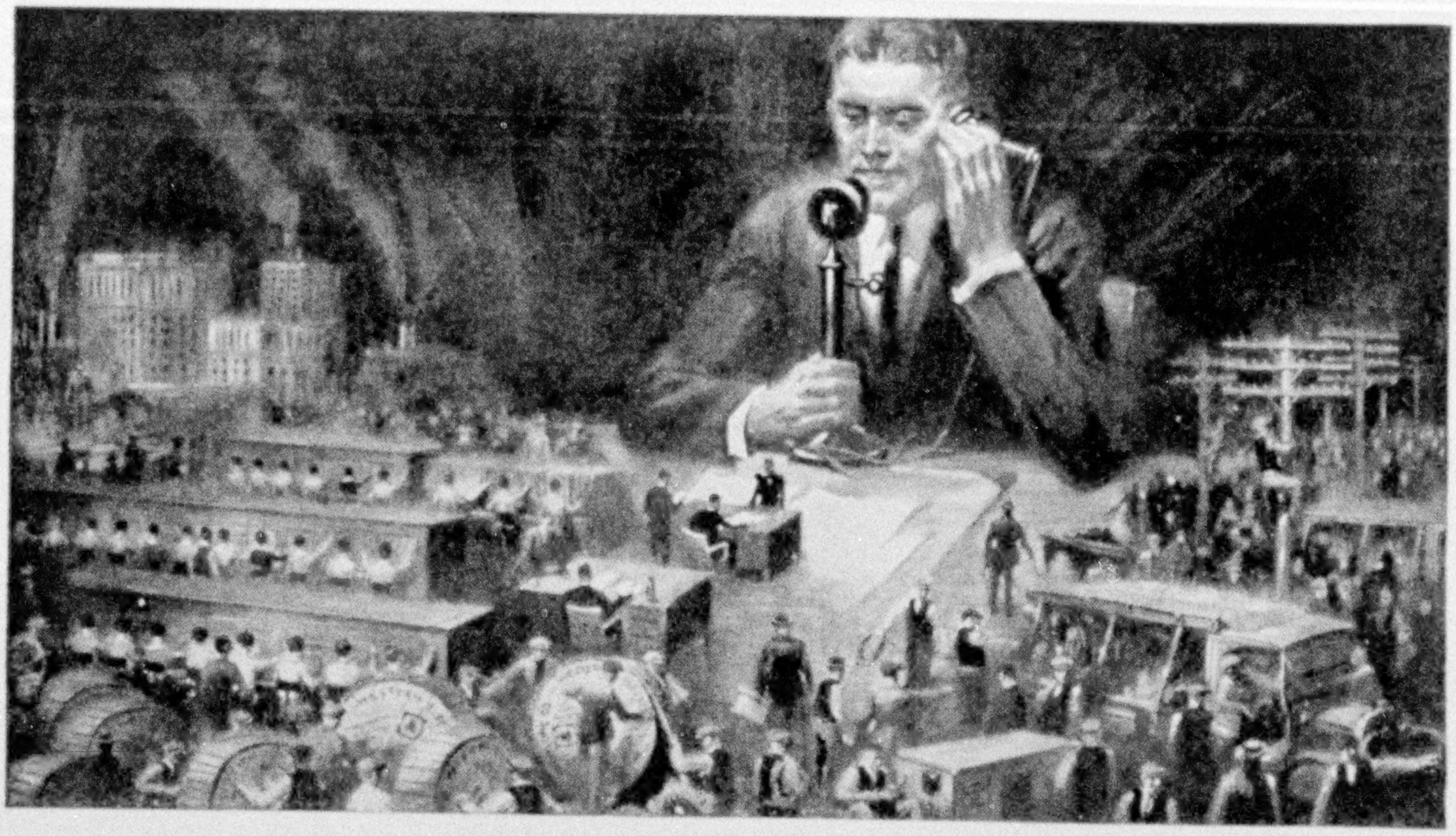


Soup for health—
every day!

Campbell's SOUPS

LOOK FOR THE RED-AND-WHITE LABEL

XUM



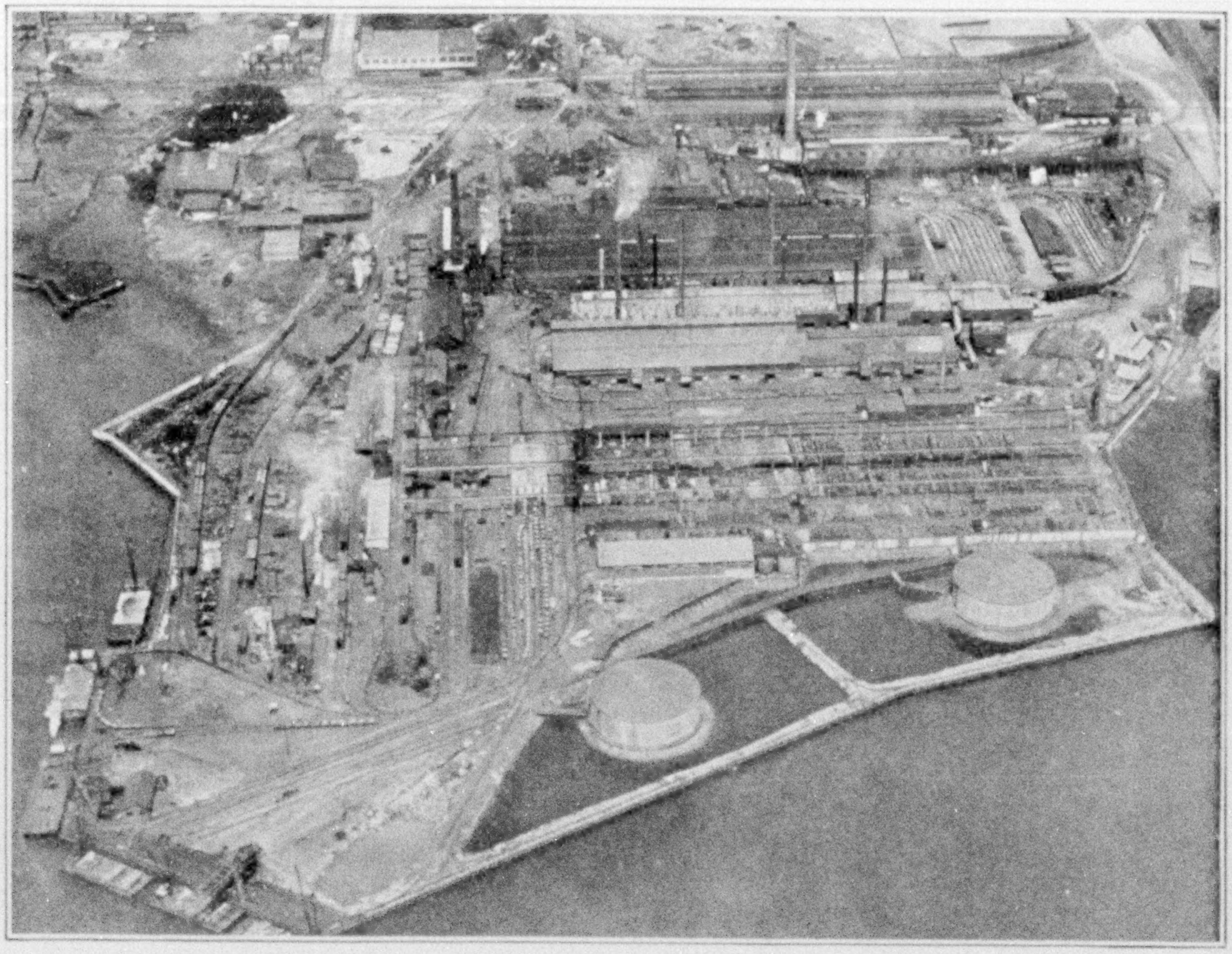
Marshaling the Telephone Forces

In the simple act of lifting the telephone receiver from its hook every subscriber becomes the marshal of an army. At his service, as he needs them, a quarter of a million men and women are organized in the Bell System. One skilled corps of the telephone army moves to place him in talking connection with his neighbor in the next block, in the next state or across the continent. Another highly trained corps is on duty to keep the wires in condition to vibrate with his words. Still others are developing better apparatus and methods, manufacturing and adding new equipment, and installing new telephones to increase the subscriber's realm of command.

The terrain of the telephone army is the whole United States, dotted with 14,000,000 instruments, all within range of the subscriber's telephone voice. Even in the remote places this army provides equipment and supplies. Its methods of operation are constantly being improved, that each user may talk to his friends with increased efficiency. Millions of money are spent in its permanent works. Yet its costs of operation are studiously held to the minimum, that the subscriber may continue to receive the cheapest as well as the best telephone service in the world.

The permanent objective of the Bell System army is to meet the telephone needs of the nation—a hopeless task were not its command unified, its equipment adequately maintained and its personnel trained in the latest developments of telephone art.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AND ASSOCIATED COMPANIES
BELL SYSTEM
One Policy, One System, Universal Service



Broad Views—

for FAR-SIGHTED INVESTORS

Valuable lands, buildings, expensive equipment, intricate machinery—these are some of the assets back of the bonds of strong industrial companies.

To such impressive values must be added the less tangible factors of experienced management, earning ability and good will, if the purchaser of industrial securities is to have a thoroughly desirable investment.

Careful analysis of management and earnings, as well as of physical equipment, always precedes the recommendation of such securities by The National City Company.

Our monthly publication gives a broad range of bonds from which to select. You ought to have a copy.

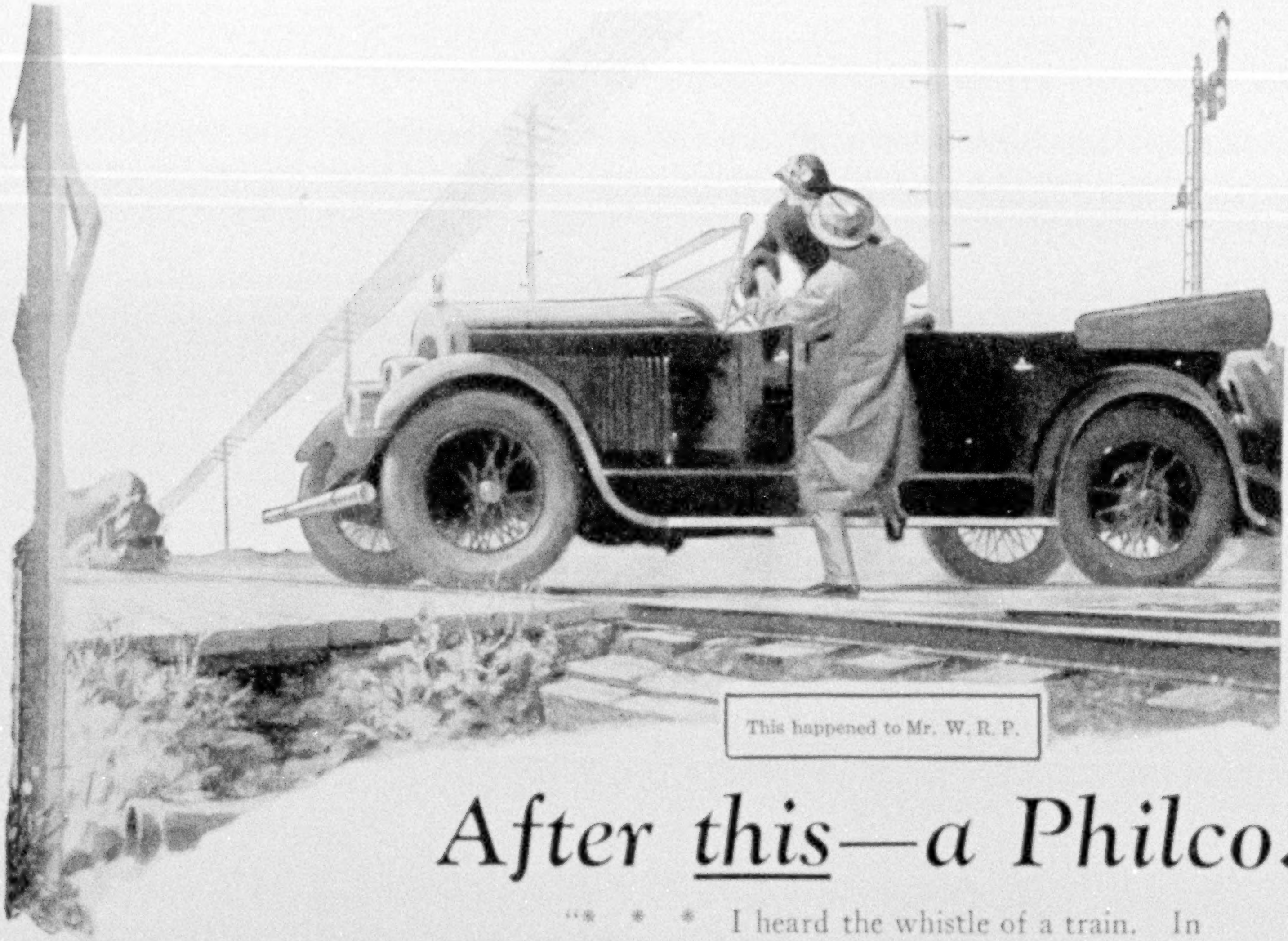
Call, or upon request we will mail one to you.

The National City Company

National City Bank Building, New York

You will find offices in more than 50 leading cities in the United States, Canada and abroad

BONDS SHORT TERM NOTES ACCEPTANCES


This happened to Mr. W. R. P.

After this—a Philco!

"* * * I heard the whistle of a train. In an effort to spurt the car forward I stalled the engine and the car stopped on the tracks.

"* * * The train was coming rapidly, shrieking violent warning. I left the engine in high gear and stepped on the starter. *But my battery failed me.* We escaped, but the car was smashed to smithereens."

Thus writes Mr. Wen R. Phillips, Managing Editor of "Southern Construction," Miami, Fla., in describing a perilous—almost fatal—experience from battery failure while touring with his wife in Central Indiana.

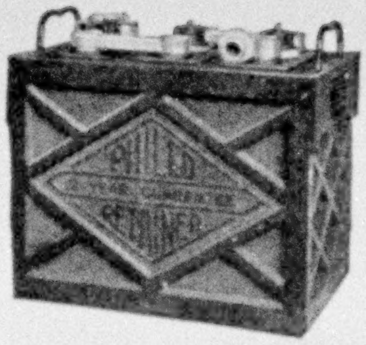
* * * *

You can't drive comfortably, economically or safely with an under-size, under-powered battery. Increasing thousands of motorists, like Mr. Phillips, realize this fact—and they're buying sure-fire, power-packed Philco Diamond-Grid Batteries.

Whether you now own a car or are about to buy one—install a long-life, super-powered Philco! Its famous Diamond-Grid Plates, Philco Retainers, Quarter-Sawed Separators and other exclusive Philco Features are your surest safe-guards against the discomforts and perils of battery failure.

Look in your phone book for "Philco Battery Sales and Service," or write us.

Philadelphia Storage Battery Co., Philadelphia



LOWEST PRICE IN HISTORY

In spite of the general increase in battery prices, we are able to *reduce* still further the price of the famous

PHILCO RETAINER BATTERY

Over-size Over-powered
Diamond Grid Plates
Guaranteed 2 years

BAR GRID BATTERIES
$15.95*

** Ford Size—exchange price east of Mississippi River.*

PHILCO DIAMOND GRID BATTERIES

FOR RADIO OWNERS. You can now buy a genuine rechargeable Philco Radio Battery for UV199, WD-11 and WD-12 tubes, including a Philco Charger, FOR $15.00 or less

or

A Philco Battery that will satisfactorily operate up to six UV201A or equivalent tubes, including a Philco Double Charger, FOR $25.00 or less.

Serve Whitman's

Chocolates have won a place all their own in social life and home living.

At luncheon or afternoon tea a few pieces of well-chosen chocolates add charm as well as substance. For more formal affairs chocolates are last but not least, on a well-planned menu. Bridge is not complete, for many players, without chocolates. More and more everyday home life is sweetened by chocolates.

Whitman's are first choice, not only for their original quality, but for the almost perfect system of distribution everywhere through accredited retail stores, which handle these perishable candies with care.

Suggested for home use is the Standard Package—an all 'round Whitman assortment, direct descendant of the package that first made the name famous, in 1842.

Write for illustrated booklet:
"On Choosing Chocolates"

STEPHEN F. WHITMAN & SON, Inc.
Philadelphia

One of Whitman's
QUALITY GROUP

Whitman's
STANDARD
Chocolates

The Great Dancer Pavlowa
and the Cantilever Shoe

Cantilever Stores

Cut this out for reference

Akron—11 Orpheum Arcade
Albany—Hewett's Silk Shop, 15 N. Pearl St.
Allentown—907 Hamilton St.
Atlanta—126 Peachtree Arcade
Atlantic City—2019 Boardwalk (Shelburne)
Baltimore—325 North Charles St.
Binghamton—Parlor City Shoe Co.
Birmingham—219 North 19th St.
Boston—Newbury St. cor. Clarendon St.
Bridgeport—1025 Main St. (2nd floor)
Brooklyn—516 Fulton St. (Primrose Bldg.)
Buffalo—641 Main St.
Burlington, Vt.—Lewis & Blanchard Co.
Canton, O.—H. M. Horton Co.
Charlotte—226 North Tryon St.
Chicago—(30 E. Randolph St. (Room 502)
1050 Leland (near Broadway)
835 E. 61st cor. Drexel Ave. (Woodlawn)
Cincinnati—The McAlpin Co.
Cleveland—1505 Euclid Ave.
Columbus, O.—104 E. Broad St. (at 3rd)
Dallas—Volk Bros. Co.
Dayton—The Rike-Kumler Co.
Denver—224 Foster Bldg.
Des Moines—W. L. White Shoe Co.
Detroit—41 E. Adams Ave.
Duluth—107 West First St. (Near 1st Ave., W.)
Elizabeth—258 No. Broad St.
Evanston—North Shore Bootery
Evansville—310 So. 3rd St. (near Main)
Fort Wayne—Mathias App's Sons
Fort Worth—Washer Bros.
Grand Rapids—Herpolsheimer Co.
Harrisburg—26 No. 3rd St. (Second floor)
Hartford—Trumbull & Church Sts.
Houston—205 Foster—Bank Commerce Bldg.
Huntington, W. Va.—McMahon-Diehl
Indianapolis—L. S. Ayres & Co.
Jacksonville—Golden's Bootery
Jersey City—Bennett's, 411 Central Ave.
Kansas City, Mo.—300 Altman Bldg.
Knoxville—Spence Shoe Co.
Lincoln—Mayer Bros. Co.
Long Beach, Calif.—Farmers' Bank Bldg.
Los Angeles—505 New Pantages Bldg.
Louisville—Boston Shoe Co.
Lowell—The Bon Marche
Madison—Family Shoe Store
Memphis—28 No. Second St.
Milwaukee—Brouwer Shoe Co.
Minneapolis—25 Eighth St. South
Mt. Vernon, N. Y.—A. J. Rice & Co.
Nashville—J. A. Meadors & Sons
Newark—897 Broad St. (2nd floor)
New Bedford—Olympia Shoe Shop
New Haven—153 Court St. (2nd floor)
New Orleans—109 Baronne St. (Room 209)
New York—14 W. 40th St. (opp. Public Library)
Norfolk—Ames & Brownley
Oakland—516—15th St. (Opposite City Hall)
Oklahoma City—The Boot Shop
Omaha—1708 Howard St.
Pasadena—378 E. Colorado St.
Passaic—37 Lexington Ave.
Paterson—10 Park Ave. (at Erie Depot)
Pawtucket—Evans & Young
Peoria—Lehmann Bldg. (Room 203)
Philadelphia—1300 Walnut St.
Pittsburgh—The Rosenbaum Co.
Pittsfield—Wm. Fahey's, 234 North St.
Plainfield—M. C. Van Arsdale
Portland, Me.—Palmer Shoe Co.
Portland, Ore.—353 Alder St.
Providence—The Boston Store
Reading—Sig. S. Schweriner
Richmond, Va.—Seymour Sycle
Roanoke—I. Bachrach Shoe Co.
Rochester, N. Y.—257 Main St. (3rd floor)
St. Joseph, Mo.—216 N. 7th (Arcade Bldg.)
St. Louis—516 Arcade Bldg. (opp. P. O.)
St. Paul—43 E. 5th St. (Frederic Hotel)
Sacramento—208 Ochsner Bldg., K near 7th
Salt Lake City—Walker Bros. Co.
San Diego—The Marston Co.
San Francisco—Phelan Bldg. (Arcade)
Schenectady—448 State St.
Scranton—Lewis & Reilly
Seattle—Baxter & Baxter
Sioux City—The Pelletier Co.
Spokane—The Crescent
Springfield, Mass.—Forbes & Wallace
Syracuse—121 West Jefferson St.
Tacoma—255 So. 11th St. (Fidelity Bldg.)
Toledo—LaSalle & Koch Co.
Trenton—H. M. Voorhees & Bro.
Troy—35 Third St. (2nd floor)
Tulsa—Lyon's Shoe Store
Utica—28 & 30 Blandina St., Cor. Union
Washington—1319 F Street
Wheeling—Geo. R. Taylor Co.
White Plains—Cedney Boot Shop
Wilmington, Del.—Kennard-Pyle Co.
Worcester—J. C. MacInnes Co.
Yonkers—22 Main St.
Youngstown—B. McManus Co.

Agencies in 462 other cities

Anna Pavlowa

Photo by Mishkin, N.Y.

Men and Women can be Healthier and Happier if their Feet are Normal

ANNA PAVLOWA, whose feet have carried her to fame and fortune, is a keen student of feet and shoes. In a "New York Sun and Globe" interview she says:

> "The state of comfort of the feet has a direct effect upon the state of mind. I know a brilliant writer who can compose, if the need be urgent enough, with a bad headache, but who cannot write a line if he is wearing tight shoes."

Madame Pavlowa is also quoted in "The American Weekly" as follows:

> "We should insist upon our shoes being flexible, not to paralyze the muscles of the feet."

In a letter to the makers of the Cantilever Shoe she says:

> "Our walk should be free, graceful and strong, and it can be in a shoe that is flexible like the Cantilever. In such a shoe, miles of walking only serve to make the foot muscles more lithe and vigorous."

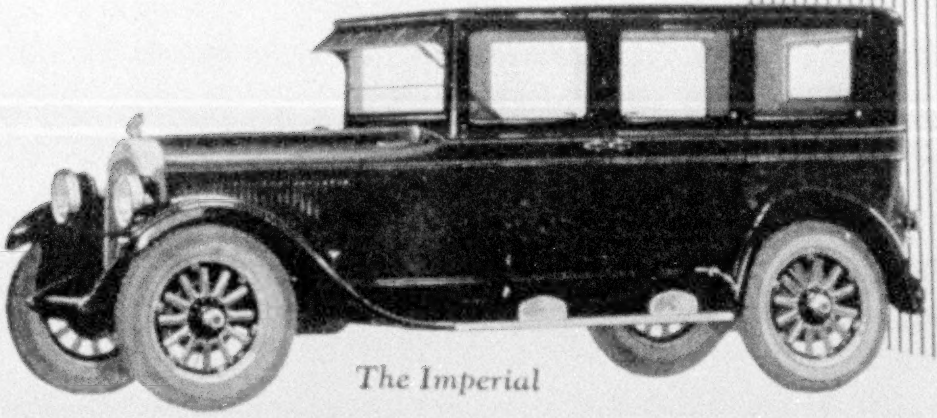
The Cantilever Shoe for men and women has a flexible arch. It permits the muscles upon which the strength of the foot depends to gain the springy elasticity of health. The well-set heel distributes the body weight evenly over the foot so that there is no strain on any weak point. The natural shape of the shoe adds to your comfort.

Cantilever boots and oxfords for men are dignified, good looking and comfortable. For women, there are pretty strap pumps, trim oxfords and snug boots. Fine leathers and excellent workmanship characterize Cantilever Shoes.

If you do not find a nearby dealer in the list at the left, write the manufacturers, Morse & Burt Co., 16 Carlton Avenue, Brooklyn, New York, for the address of a more conveniently located store.

Cantilever Shoe

for Men and Women



The Imperial

How The Chrysler Six Gets Its Power, Pull, Speed and Snap

You are running along at, say, 25 in your Chrysler. Put on your 4-wheel brakes. Pull it down to five miles an hour, to three. There isn't a tremor.

Now, put your foot on the accelerator.

In high speed, your Chrysler Six pulls away softly, but clearly, surely, powerfully.

Never mind if you are traveling only two or three miles an hour; give her the "gas."

In no time, your speedometer says 40; then 50; then 60—65—68—70—and more.

Think of it; over 70 miles an hour from a motor of 3-inch bore and 4¾-inch stroke.

That's the result of balance, elimination of friction, utilization of fuel, perfect carburetion and correctly applied thermo-dynamics—the result of scientific engineering.

Every cylinder gets just the same volume of explosive mixture—and does just the same amount of work.

Anything less than this perfect distribution of the mixture would mean uneven operation of the engine.

In the Chrysler Six, every cylinder takes exactly one-sixth of the gas; every piston carries one-sixth of the working load.

That means steady pull and reduced vibration and frictional resistance.

The Chrysler Six also has a special combustion chamber.

This combustion chamber insures no left-over unburned gas in the Chrysler Six.

Then, too, the valves are symmetrical and spaced equally distant from the center of each cylinder, with valve seats completely surrounded by cooling water.

The gas comes into all cylinders at the same velocity, and the burned gas is ejected at the same rate that the new gas is taken in.

That perfect balance means flashing pick-up and marvelous speed.

So here's what really scientific engineering means to you in the Chrysler Six:

Top speed well over 70 miles an hour.

Gasoline economy safely over 18 miles per gallon.

Lugging power "on high" that will pull you through the deepest sand or mud, or take you up any hill a car can cling to.

In every detail of its design and materials, the Chrysler Six is just as fine as its performance. It is pre-eminently a quality light car. It could not be better built if it sold for twice its list price.

Be sure to see and ride in the Chrysler Six.

CHRYSLER MOTOR CORPORATION, DETROIT, MICHIGAN

The Chrysler Six

Look for "Velox" on the Back

EVERY amateur print should be made on Velox. As the only paper made exclusively for amateur negatives, it meets their requirements as no other paper can.

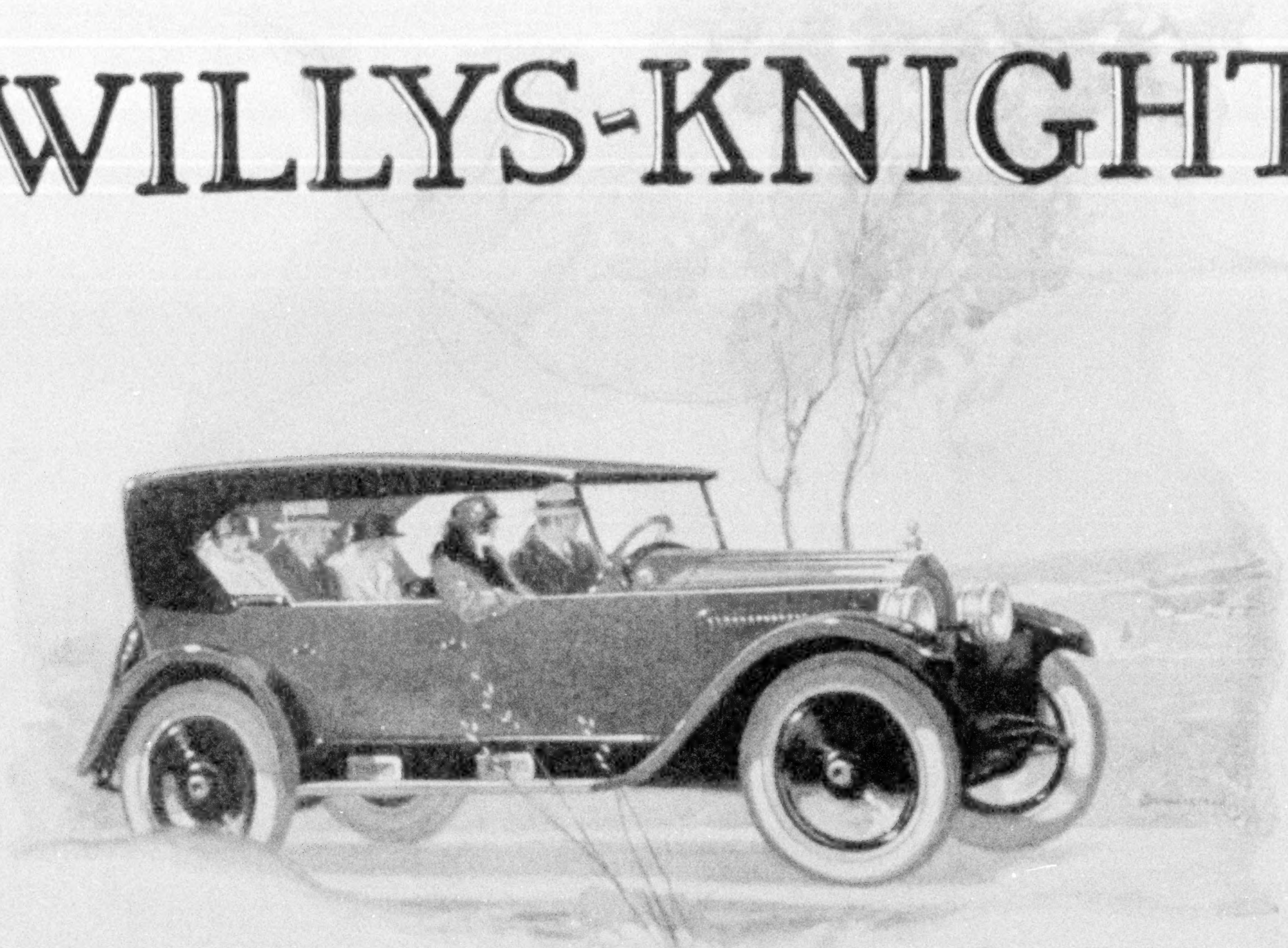
Finishers know this and that is why so many of them use nothing but Velox in their contact printing rooms.

For your protection, and to identify quality finishers with quality work, each sheet of Velox is faintly marked with the trade name.

Look for "Velox" on the back

Eastman Kodak Company, Rochester, N.Y. *The Kodak City*

WILLYS-KNIGHT



MILEAGE

BIG MILEAGE! Smooth mileage! Economical mileage! The beautiful Willys-Knight gives you more satisfying mileage than you ever dreamed you could get from a car.

This fine car keeps youth in your veins and age out of mileage. Its beauty keeps you proud. Its action keeps you happy. Mileage makes your heart grow fonder.

The wonderful Willys-Knight sleeve-valve engine is utterly free from the woes of ordinary poppet-valve engines. It *actually improves with use!* No valve-grinding or carbon-cleaning. Owners report 50,000 miles and more without a single engine adjustment. As to total mileage—*no Willys-Knight engine has ever been known to wear out!*

WILLYS-OVERLAND, Inc., TOLEDO, OHIO
Willys-Overland Sales Co. Ltd., Toronto, Can.

The Day of the Knight is Here!

5 Passenger Touring
$1175 *f.o.b. Toledo*

In May, the FRANCE, famous for its cuisine, returns virtually as a new ship to the French Line Service. It has been converted into an oil burner, giving greatly increased speed, and has been redecorated throughout, more cabins and baths also having been added.

Did You Ever Enjoy REAL French Cooking?

YES, you say—and perhaps you have if you have been to France or if you have crossed on the French Line. For then and then only do you know that the chef's very happiness depends on your delight.

His soul goes into his cooking. Hors d'oeuvres of a tartness unique, rich soupes au crême, Parisian sauces with your fish, great roasts done to a turn and seasoned to a nicety; salads tender, delicious little pastries, and luscious fruits from the French provinces—truly there is a zest to the French cooking that you cannot find here at home.

This artistry, this wonderful mastery of the culinary art you will find on the de luxe French liners. It is noted among epicures and a main reason why so many discriminating travelers cross on the French Line.

In fact, on the French Line you are in Paris six days before you get there, for these magnificent steamships are France on the high seas.

Express de Luxe Liners
New York
Plymouth Havre
PARIS FRANCE
LAFAYETTE

New York Havre Paris
One-Cabin Steamers
DE GRASSE LA SAVOIE
CHICAGO SUFFREN
ROCHAMBEAU

New York Vigo Bordeaux
LA BOURDONNAIS
ROUSSILLON

New Orleans Havre Paris
DE LA SALLE NIAGARA

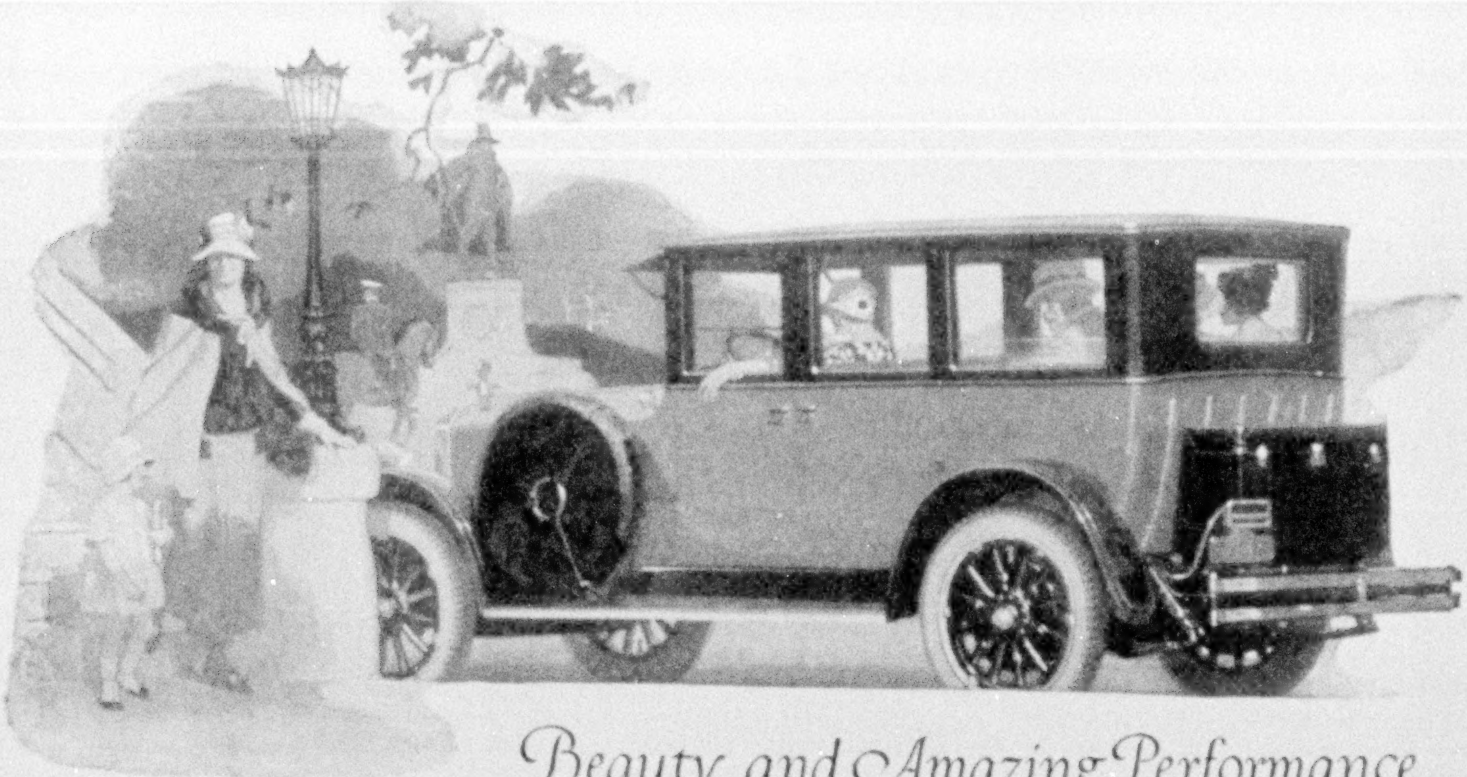
North African Motor Tours

French Line

Compagnie Générale Transatlantique, 19 State Street, New York

Offices and Agencies in Principal Cities of Europe and the United States

IN ALL THE WORLD NO CAR LIKE THIS



Beauty and Amazing Performance

De Luxe Sedan of "Open Car" Sprightliness — 50 Horsepower

HERE'S the attractive New Jewett De Luxe Sedan—pleasing in appearance inside and out—and *such a performer!* This Sedan has "open car" performance. It runs from 2 to 60 miles an hour, or more, in high. Passes most any car on any hill. Picks up from 5 to 25 miles an hour in 7 seconds, in high.

Jewett has full 50 h. p.—a cubic inch of motor displacement for every 11¼ pounds of weight. In certain "light" sixes each cubic inch of motor must pull 13.5 pounds—13.7—12.8—14.3—not one but will be sluggish compared with Jewett.

Jewett is a sturdy, powerful six, not a "light" six. Has Paige-Timken axles front and rear; Paige-type clutch and transmission; all-steel universal joints; 6-inch-deep frame.

All Jewetts are as roomy inside as larger, cumbersome cars, yet park easily in a 16½-foot space, turn in a 42-foot street; require but a 14-foot alley to your garage.

In all the world no car like this! Jewett Six combines advantages and mechanical superiorities no other car offers. Jewett is matched mechanically only by cars costing $700 to thousands more—and then at the sacrifice of convenience and economy.

Equipment includes nickeled spring bumpers, front and rear; nickeled radiator, motometer, head and side lights; extra cord tire, tube, rim and cover, mounted at side; trunk rack and trunk; nickeled body guard-rails; automatic stop-light; automatic wind-shield wiper; rear-view mirror; sun visor.

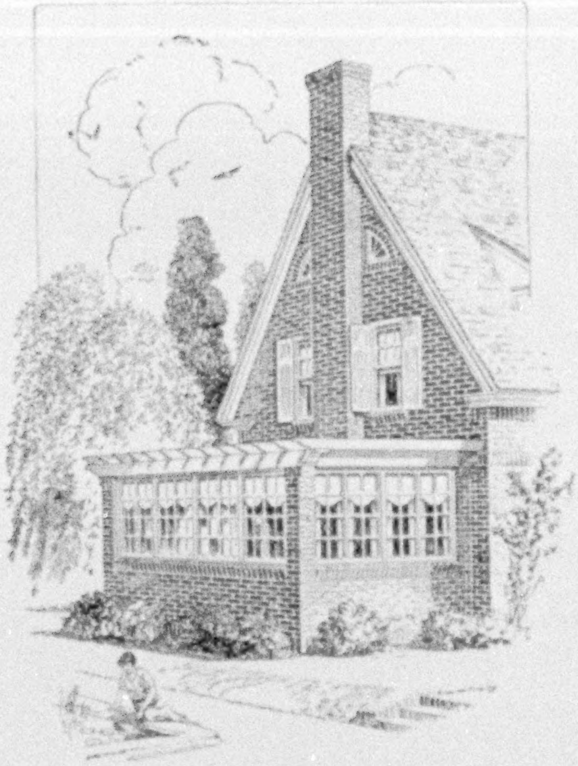
There's a Jewett dealer near you. Drive this car. [605-A]

Touring........	$1065	Sedan.........	$1495	De Luxe Touring.	$1220
Brougham......	1325	De Luxe Roadster	1195	De Luxe Sedan ..	1695

Prices at Detroit, Tax Extra.

JEWETT SIX

PAIGE BUILT



The Growing Popularity of the Face Brick House

HOME, the most cherished dream of the American family, finds its truest expression when beauty and durability are combined with economy. That is why Face Brick is increasing in popularity year by year. Its wide range of color tones and textures satisfies the most divergent tastes. It is durable as the hills. The savings in repairs, painting, depreciation, fuel costs and insurance rates soon wipe out the slightly higher initial cost of the Face Brick house and make it the most economical home you can build. These matters are fully discussed in "The Story of Brick." For your copy, address American Face Brick Association, 1737 Peoples Life Building, Chicago, Illinois.

Booklets you ought to have:

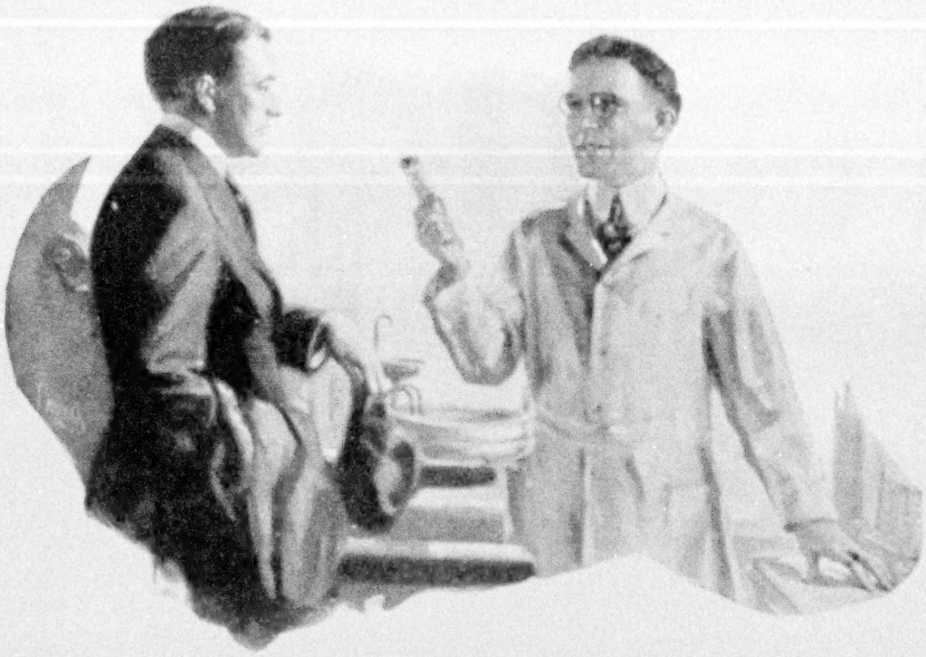
"The Story of Brick," a most artistic, illustrated book with indispensable information for anyone thinking of building. So interesting that it is used as a reader in a number of schools. Sent free. "Invaluable to home-builders. Information well worth $5.00," says one of hundreds of enthusiastic readers.

"Face Brick Bungalow and Small House Plans" embrace 96 designs of Face Brick bungalows and small houses. They are issued in four booklets, 3 to 4-room houses, 5-room houses, 6-room houses, and 7 to 8-room houses. The entire set for one dollar; any one of the books, 25 cents. Please send stamps or money order. "I would not part with them for a hundred times their cost. They are simply invaluable to me."

"The Home of Beauty" contains 50 designs of Face Brick houses, mostly two stories, selected from 350 designs submitted by architects in a nation-wide competition. Sent for 50 cents. "'The Home of Beauty' is far ahead of any book of house plans I have ever seen."

"The Home Fires" is a new book containing 20 attractive original fireplace designs, 25 pictures of fireplaces designed by well-known architects, and an article on proper fireplace construction. Sent for 25 cents. "We are truly delighted with this piece of literature."

XUM



That's the Way

To teeth you envy
Just combat the dingy film

When you see glistening teeth—as you do everywhere now—remember how folks get them.

Leading dentists the world over are urging a fight on film. Millions now employ the method. And wherever you go you now see the results.

If you have not yet found that method, ask for this ten-day test.

Why teeth discolor

You feel on your teeth a viscous film. It clings to teeth, enters crevices and stays. If you leave that film, it becomes discolored by food or tobacco stains. Then it forms dingy coats. Tartar is based on film. That's why teeth grow cloudy.

Film also holds food substance which ferments and forms acid. It holds the acid in contact with the teeth to cause decay.

Germs breed by millions in film. They cause many serious troubles, local and internal. Thus film is the teeth's chief enemy.

Now easy to combat

Dental science, in late years, has learned how to fight that film. It has found two film combatants. One acts to curdle film, one to remove it, and without any harmful scouring.

Able authorities proved these methods effective. Then a new-type tooth paste was perfected to apply those methods daily.

That tooth paste is called Pepsodent. Careful people of some fifty nations are employing it today.

It also does this

Pepsodent does two other things which research proved essential. It multiplies the alkalinity of the saliva. That is there to neutralize mouth acids, the cause of tooth decay.

It multiplies the starch digestant in the saliva. That is there to digest starch deposits which may otherwise ferment and form acids.

With many diets, those things are essential. To countless homes they now are bringing a new dental era.

Do this and see

Pepsodent results are quick and apparent. They are seen and felt, so no one can doubt them. And they mean so much—whiter, cleaner, safer teeth—that you should find them out.

Send the coupon for a 10-Day Tube. Note how clean the teeth feel after using. Mark the absence of the viscous film. See how teeth whiten as the film-coats disappear.

You will know in a week what this way means, both to you and yours. Cut out coupon now.

Protect the Enamel

Pepsodent disintegrates the film, then removes it with an agent far softer than enamel. Never use a film combatant which contains harsh grit.

Pepsodent
REG. U.S. PAT. OFF.

The New-Day Dentifrice

A scientific tooth paste based on modern research, now advised by leading dentists the world over.

10-Day Tube Free 1243

THE PEPSODENT COMPANY,
Dept. 755, 1104 S. Wabash Ave., Chicago, Ill.
Mail 10-Day Tube of Pepsodent to

....

....

....

Only one tube to a family

Only a Chandler Gives You These!

1. Pikes Peak Motor

This famous power plant has established the Chandler as the national performance champion. No stock car, regardless of cost or class, has ever held so many official high gear records; or so conclusively demonstrated its mastery over the problems of traffic driving.

2. Traffic Transmission

By employing an entirely new principle of power transmission, Chandler has made it impossible to clash gears or to fail in an attempted speed change. This exclusive feature has created a furore in the automotive world. The amazing ease of driving it provides has delighted thousands.

3. New Sedans at Lower Prices

Sedan bodies of such genuine beauty and structural solidity have never been obtainable at so slight an extra cost over touring models—$260 and $410 for the 5-passenger types, $460 for the seven. Despite the phenomenally low prices, the new Fisher bodies reveal in their grace of line, excellence of detail and sound construction, the unstinting craftsmanship of America's ablest body builders.

4-Door Sedan	7-Passenger Sedan	Chummy Sedan	Touring Car 5-Passenger
$1895	**$2095**	**$1745**	**$1485**

All Prices F. O. B. Cleveland

(The Traffic Transmission is built complete in the Chandler plant under Campbell patents.)

CHANDLER

THE CHANDLER MOTOR CAR COMPANY · CLEVELAND
Export Dept., 1819 Broadway, New York City
Cable Address "*Chanmotor*"

COLGATE'S

Shaving Stick

"HANDY GRIP" AND REFILL

SHAVING STICK
COLGATE & CO
NEW YORK USA

For Comfort, Convenience and Economy

When we say to you that the Shaving Stick has important advantages over shaving preparations in any other form, we can do so without bias, for we manufacture shaving sticks, powder and cream.

In its attractive nickel box, our "Handy Grip" Shaving Stick is most convenient for traveling. It will not crush when packed, and it makes a wonderful lather for *easy* shaving.

It is not uncommon for a Colgate Shaving Stick to last more than a year in daily use.

The famous "Handy Grip", with a trial-size shaving stick in nickel box, sent for 10c. When the trial stick is gone, buy Colgate "Refills" for the price of the soap alone, 25c.

COLGATE & CO. *Established 1806* NEW YORK

KIMBALL

"The Instrument of Yesterday, Today and Tomorrow"

"KIMBALL Pianos—admirable in every way." So said DAVID BISPHAM, one of the best loved of yesterday's operatic and concert baritones, whose memory lives in the hearts of music lovers of today.

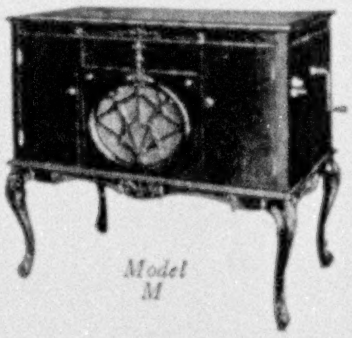
Equal emphasis marks the praise of MYRTLE ELVYN, American pianiste, famous throughout two hemispheres for her rare gifts of interpretation and originality, and whose appearances have always been a triumphal tour: "The most perfect for every phase of piano playing."

So, in a continuous chorus of praise, great artists of succeeding decades unite in acclaiming the matchless KIMBALL—the piano of imperishable fame.

Style 29

KIMBALL

Grand Pianos *Music Rolls*
Upright Pianos *Phonographs*
Player Pianos *Pipe Organs*
Reproducing Pianos



Model M

W. W. KIMBALL CO., Dept. KNG
306 South Wabash Avenue, Chicago, Ill.

Gentlemen: Please mail catalog and information on instrument marked X:
☐ KIMBALL Reproducing Pianos
☐ KIMBALL Grand Pianos
☐ KIMBALL Phonographs
☐ KIMBALL Upright Pianos
☐ KIMBALL Player Pianos

Name ....

Address......................................

Descriptive catalogs, also nearest dealer's address sent to you on request

W. W.
KIMBALL CO.
(Established 1857)
Factory and Executive Offices
CHICAGO, U. S. A.

High School Course in Two Years

This simplified, complete High School Course—specially prepared for home study by leading professors—meets all requirements for entrance to college and the leading professions.

30 Other Courses

Whether you need High School training or specialized instruction in any trade or profession the American School can help you. Check and mail coupon for Free Bulletin.

American School
Drexel Ave. and 58th Street
Dept. H-3169
Chicago

American School, Dept. H-3169, Drexel Ave. and 58th St., Chicago

Send me full information on the subject checked and how you will help me win success.

.........Architect
.........Building Contractor
.........Automobile Engineer
.........Automobile Repairman
.........Civil Engineer
.........Structural Engineer
.........Business Manager
.........Cert. Public Accountant
.........Accountant and Auditor
.........Bookkeeper
.........Draftsman and Designer
.........Electrical Engineer
.........Electric Light & Power
.........General Education
.........Vocational Guidance
.........Business Law
.........Lawyer
.........Machine Shop Practice
.........Photoplay Writer
.........Mechanical Engineer
.........Shop Superintendent
.........Employment Manager
.........Steam Engineer
.........Foremanship
.........Sanitary Engineer
.........Surveyor (and Mapping)
.........Telephone Engineer
.........Telegraph Engineer
.........High School Graduate
.........Fire Insurance Expert
.........Wireless Radio
.........Undecided

Name ....

Address......................................

A Garden Full of Gladioli for $2.00

The Gladiolus is one of the most satisfactory flowers grown, and there is no reason why every family cannot enjoy this grand flower—it is as easy to grow as the potato.

Blooms from July to frost if you plant a few bulbs each month from April to July.

For **Two Dollars** we will send **50 Bulbs** of our **Grand Prize** Mixture, which covers every conceivable shade in the Gladiolus kingdom.

Each year we sell thousands of these bulbs and have received numerous testimonials as to their merits.

Order Your Bulbs Now, so as to have them to plant when you begin making your garden.

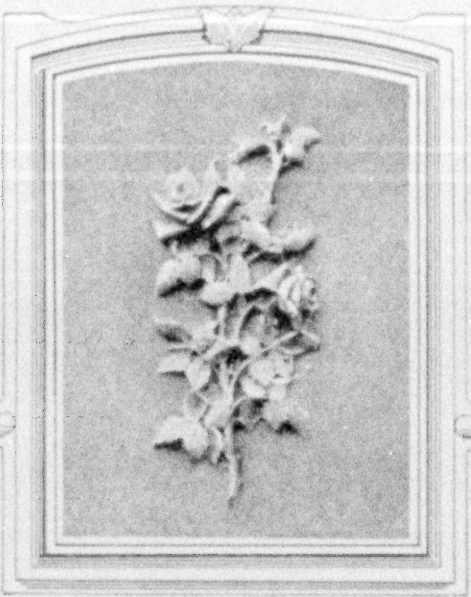
Simple cultural directions with every package

Mail this advertisement with check, money order, cash, or stamps, and secure this splendid collection, sent prepaid to any point in the U. S. east of the Mississippi. **For points West and Canada, kindly add 25c. to cover cost of delivery.**

Our 1924 Spring Seed Annual sent on request

Stumpp & Walter Co

30 and 32 Barclay Street New York



Spray of Roses
Carved in
Rock of Ages Granite

Symbolic Beauty

In Cemetery Memorials

THERE is a feeling of gratification and of duty well performed in the selection of a family memorial of *Rock of Ages* granite. For there is the assurance that it will be worthy to perpetuate an honored name.

Rock of Ages is a monumental granite of great strength and hardness, but withal so beautiful in its natural gray color and so suggestive of nobility that its name has become a synonym for leadership among the quarry products of the world. In polished finish it rivals the brilliance of the sun.

Boutwell, Milne & Varnum Company

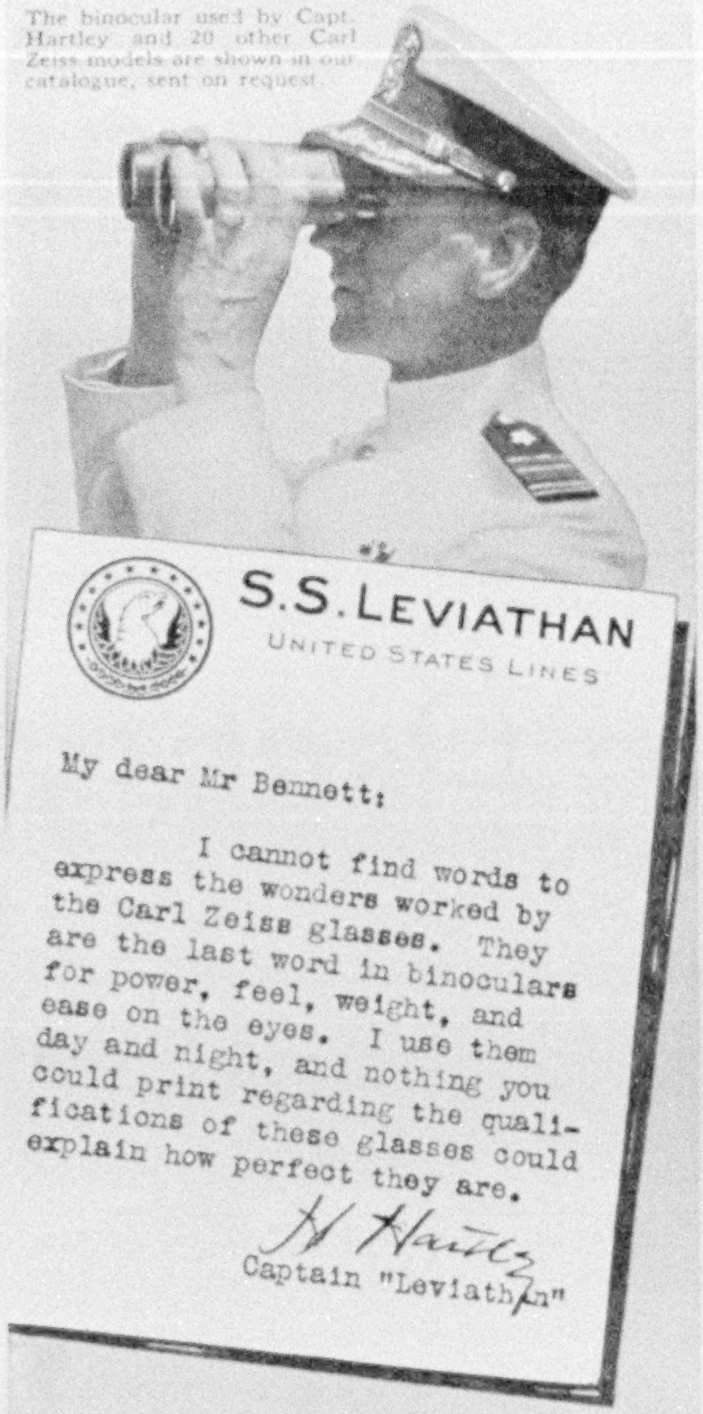
Quarriers—Rock of Ages

Montpelier :: :: Vermont

ROCK OF AGES TRADE MARK

A Certificate of Perfection will accompany each memorial of *Rock of Ages* granite if your request is made when placing order with your local memorial merchant.

Write for free Educational Booklet "E"



The binocular used by Capt. Hartley and 20 other Carl Zeiss models are shown in our catalogue, sent on request.

S.S. LEVIATHAN
UNITED STATES LINES

My dear Mr Bennett:

I cannot find words to express the wonders worked by the Carl Zeiss glasses. They are the last word in binoculars for power, feel, weight, and ease on the eyes. I use them day and night, and nothing you could print regarding the qualifications of these glasses could explain how perfect they are.

H Hartley
Captain "Leviathan"

You can see seven times as far with this Carl Zeiss Prism Binocular, so highly recommended by Capt. Hartley.

Carl Zeiss are the only *wide angle* binoculars—the field glasses with the extreme field of view and remarkably brilliant illumination.

Over 20 models, from 3 to 18 power—the theatre-glass, the bird-glass, a binocular for the hunter, yachtsman, explorer—a glass for every purpose.

At opticians, camera- and sporting-goods stores. Write us for catalog.

HAROLD M. BENNETT, U. S. AGT.
155 WEST 23D STREET, NEW YORK

CARL ZEISS
JENA

General Distributing Agents for Canada:
THE HUGHES OWENS CO., LTD.
Montreal, Toronto, Winnipeg, Ottawa

CARL ZEISS
Prism Binoculars

SWITZERLAND

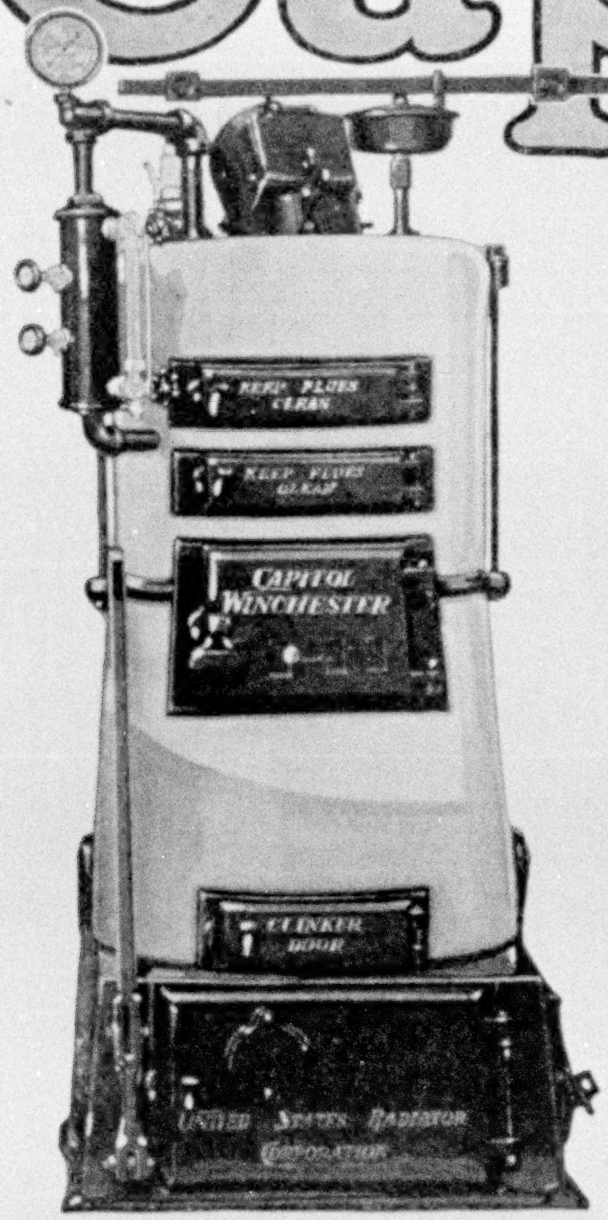
SWITZERLAND, the irresistible magnet which draws Americans year after year to Europe, offers an endless variety of fascinating resorts:

LAUSANNE-OUCHY, chief point on the Simplon line, headquarters for excursions in all directions. Educational center. Golf. **GENEVA,** with its classical lake, ever attractive as a resting place, and for its beauty, wealth and intellect. Excursions to Mt. Blanc. Golf. **GSTAAD,** a picturesque mountain village on the Montreux-Bernese Oberland Railway; also **KANDERSTEG,** on the Loetschberg-Simplon line. **INTERLAKEN,** the garden spot of the Bernese Oberland. Here the **JUNGFRAU RAILWAY** carries you to the "Top of the World." Near by, the lovely resorts of **GRINDELWALD** and **WENGEN. ZERMATT,** reached via the **LOETSCHBERG RAILWAY,** and *Visp,* basking at the foot of the Matterhorn; **GORNERGRAT,** by rail, with its superb panoramas. **LUCERNE,** its loveliness proverbial, its variety of sports and amusements most interesting; the excursion center of central Switzerland. **ZURICH,** the country's metropolis. The **GRISONS,** an alpine wonderland, with invigorating climate, curative springs and sport facilities.

Write for packet No. 107—"Guide to Switzerland"—many illustrated booklets and maps; mailed on receipt of 10c. to cover postage. Address Official Agency of the

SWISS FEDERAL RAILROADS
241 Fifth Avenue, New York

Capitol


KEEP FLUES CLEAN
KEEP FLUES CLEAN
CAPITOL WINCHESTER
CLINKER DOOR
UNITED STATES RADIATOR CORPORATION

There are just two ways to buy heating equipment — on a price basis or on a quality basis.

If you are influenced solely by "price," you must be prepared to accept the entire responsibility of the investment.

If you rely upon Capitol quality, we will very gladly share the responsibility with you. Such has been our policy for thirty years.

UNITED STATES RADIATOR CORPORATION
General Offices, Detroit, Michigan

Branch and Sales Offices

*Boston
*Springfield, Mass.
*Portland, Me.
New York
*Brooklyn
*Harrison, N. J.
*Philadelphia
*Baltimore
Buffalo
Pittsburgh
*Cleveland
*Columbus
*Cincinnati
*Detroit
*Chicago
*Indianapolis
*Milwaukee
*Minneapolis
*Des Moines
*Omaha
*St. Louis
*Kansas City
*Seattle
*Portland, Ore.
*Louisville

*Warehouse stocks carried at points indicated by star

Boilers

FAIRFACTS Fixtures, permanently installed in the walls of your bathroom, last as long as the house itself. They are made of glistening snow-white china,—the only material that will not develop surface cracks or become stained, tarnished or dingy. They can be cleaned instantly with a damp cloth.

Fairfacts Fixtures are a never-ending delight to the home owner and always excite the admiration of guests. They add distinction to any bathroom, from the simplest to the most luxurious.

There is a complete variety to meet every need shelves, towel bars, paper holders, soap holders, tumbler and tooth brush holders and many other bathroom conveniences.

A tile contractor should install Fairfacts Bathroom Fixtures when your house is built or remodeled.

SEND FOR BOOKLET

WE HAVE *prepared a booklet "The Perfect Bathroom" which will tell you all about Fairfacts China Fixtures. Write for it today.*

THE FAIRFACTS COMPANY, INC.
Manufacturers
Dept. N-1 234-236 West 14th Street
New York City

Look for this Fairfacts *trade-mark*

Fairfacts Fixtures
BUILT IN YOUR BATHROOM WALLS

THE VOSE GRAND
represents over 70 years of experience devoted to the attainment of an ideal. Its incomparable tone brings a lifetime of satisfaction to the lover of good music.

We Challenge Comparisons
Write for our beautifully illustrated catalog and floor pattern of the Vose Grand, also our easy payment plan.

Vose & Sons Piano Co., 146 Boylston St., Boston

VOSE

EUROPE

Attractive Tours at Reasonable Rates
Frequent Sailings, Most Complete Itineraries
Spring-Summer, 1924

One of the oldest Travel Organizations in the world. 49 years of satisfactory experience with the traveling public and permanent offices in Europe assure our clients many advantages.

Our Tours have no equal—the personal attention we give each Tour guarantees the best of service throughout.

Send for "Book K" for Details and Rates

FRANK TOURIST CO.
542 Fifth Avenue, New York
219 S. 15th Street, Philadelphia 582 Market Street, San Francisco
Paris *Est. 1875* *London*

DREER'S
GARDEN BOOK

is a household word with leading amateur and professional gardeners. You will find it indispensable when planning your garden this year—as a reference book for the latest and best in Seeds, Plants and Bulbs, and for its explicit cultural instructions.

It contains hundreds of photo-engravings, some in natural color, illustrating the Dreer specialties in Vegetables and Flowers.

There is a free copy of this invaluable Garden Book for you, if you will mention this publication.

HENRY A. DREER
714-716 Chestnut St. Phila., Pa.

Unique Pleasures

in a perfect summer vacationland —Come and see

IT'S the complete change and the numberless new things to see and do that make a vacation here the finest you can imagine. For Southern California is a strange land, unlike any other you have ever visited.

The weather is ideal, for one thing. Days are delightful, nights cool. The forty-four-year record taken in a central city in this district by the U. S. Weather Bureau shows the average mean temperatures to be:

44 Junes . . . . 66 deg. 44 Augusts . . . . 71 deg.
44 Julys . . . . 70 deg. 44 Septembers . 69 deg.

Summer is the *rainless season,* too. Each day is perfect for outdoor fun.

And for each day there are scores of interesting things to do.

Climb the twin peaks, Mt. Lowe and Mt. Wilson, and from a single vantage point see the great San Fernando Valley, unending miles of orange groves, historic Spanish missions, progressive cities and towns and the blue Pacific shimmering in the sunlight.

See the Hollywood Bowl, set in the foothills, where each night in summer a famous symphony orchestra delights thousands. Motor into Santa Ana Canyon and find a solitude, restful, soothing.

Stand on a rocky headland at Laguna Beach and watch the battering surf or sun yourself on a sandy beach for hours at a time. See acres of oil derricks on Signal Hill, a strange sight, indeed. Wander in gardens containing the rare blossoms of many lands.

The matchless Yosemite National Park is but a short trip away. It's an unforgettable, inspiring, tremendous spectacle. Motor over 4,000 miles of paved boulevards that lead to all these beauties, these unique sights. Truly this is a different land. You'll love it. Come and see.

Find your favorite sport better than you've ever known it. Play golf on sporty courses. Many tennis courts are available.

Ride, hike and motor through the valleys, into the mountains, anywhere you choose. Fish for brook trout or hundred-pound fighters of the sea.

Swim in the surf. Sail before a fresh breeze. Camp in a virgin forest.

Spend days and weeks doing those things you love to do—that bring the finest kind of rest and relaxation. Find complete change that builds you up and makes you fit for another year's activity.

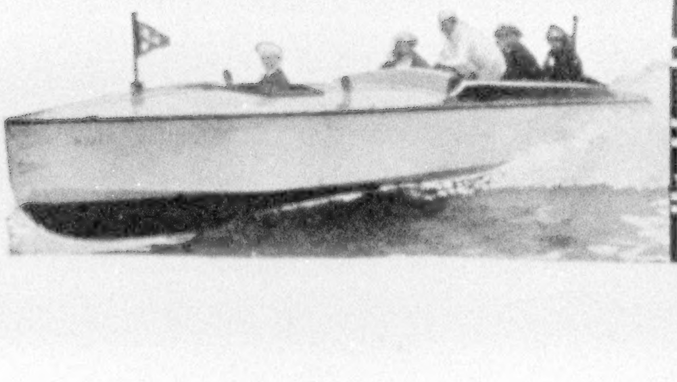
Come now, or come this summer. Special summer round-trip railroad rates make it easy. You'll find accommodations here to fit your purse. It's a great trip to which you have always looked forward. Plan now.

Ask any railroad ticket agent or send coupon to us for additional information.

But come for your finest summer. See what a vacation in this strange land will do for you in physical benefit and untold pleasure.

All - Year Club of Southern California

Near-by sources of raw material, an unmatched year-round climate, the cheapest hydro-electric power in America, and contented labor have brought an amazing industrial growth here with untold opportunities for manufacturers and investors.

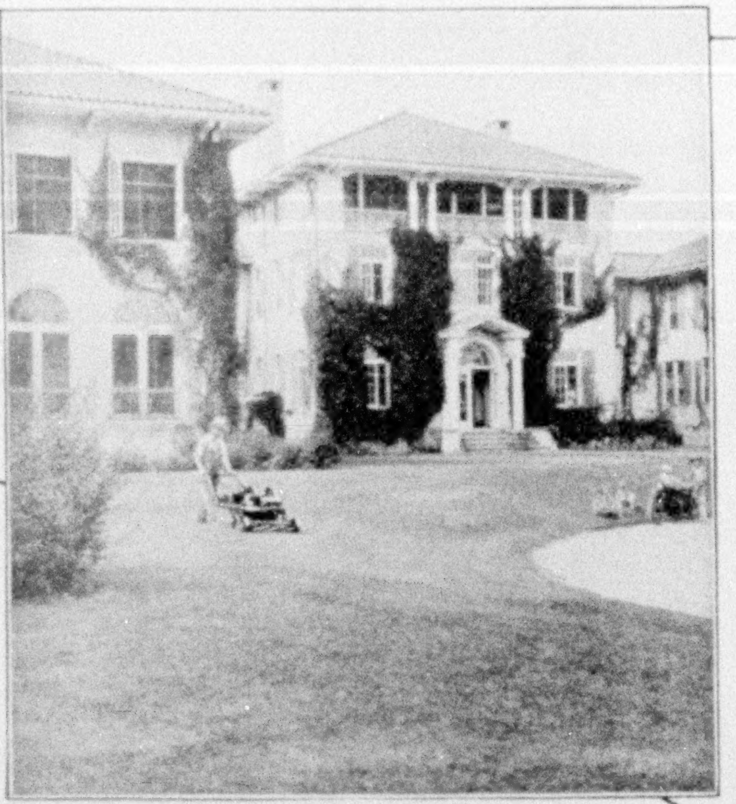


ALL-YEAR CLUB OF SOUTHERN CALIFORNIA,
Dept. 803, 2601 S. Figueroa St.,
Los Angeles, California.

Please send me full information about the summer and year-round vacation possibilities in Southern California.

Name ....

Address ....



THERE are hundreds of Ideal Power Lawn Mowers that are still giving good service after five, seven, or even more years of use. Such service means that you can buy an Ideal with complete confidence that it will do the finest work and do it over a long period of time.

The cutting units of Ideal Power Lawn Mowers have no equal. Timken Bearings, Alemite Lubrication, double-locked adjustments and special steels are features that enable them to endure season after season of punishing power service. The power plant is simple and sturdy and as dependable as a fine motor car. Why take chances on an untried product when it is a proven fact that an Ideal will serve you faithfully for years? Write for literature describing our three models.

Ideal Power Lawn Mower Co.
R. E. Olds, Chairman
422 Kalamazoo Street Lansing, Michigan
New York Chicago
13-19 Hudson St. 11 E. Harrison St.
Dealers in all Principal Cities (79)

IDEAL
Power Lawn Mowers

Ideal Junior and 30-inch Mowers. Capacities 3 to 5 acres and 5 to 8 acres daily

WHITING-ADAMS
BRUSHES

A brush expert says they are the best Hair Brushes made. They are penetrating. They go all through the hair to the roots and stimulate growth. They make a beautiful radiant sheen. The glory of woman is made more glorious with Whiting-Adams Hair Brushes.

Send for Illustrated Literature
JOHN L. WHITING-J. J. ADAMS CO.
Boston, U. S. A.
Brush Manufacturers for Over 114 Years and the Largest in the World
89

GOING TO EUROPE?

"All that is worth seeing
Seen as it should be seen"

Holland—Belgium—France—Italy—Austria—Switzerland—Germany and the British Isles, including Ireland.
Our usual comprehensive Tours leaving at frequent intervals.
June to September. Limited membership.
Best routes and service. Moderate rates.
Arrangements in Europe are under the direct management of our permanent office in London.

Cost from $785
and are really good tours
Illustrated booklet G sent free on request.

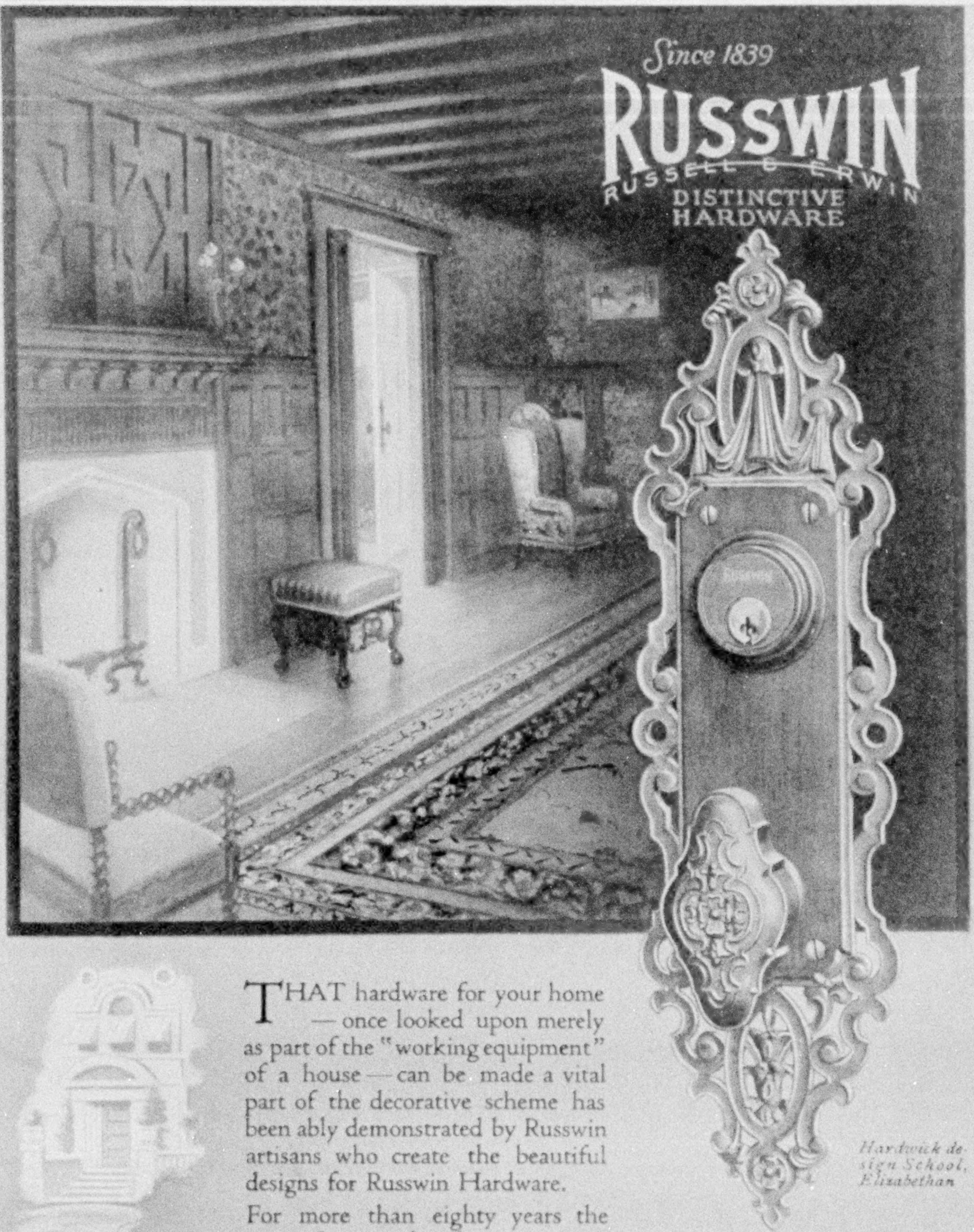
McCann's Tours, Inc.
"Since 1876"
1328 Broadway New York City

Kunderd *Gladioli*

Kunderd Gladioli lead the world in exquisite colorings and perfect form. So that you may know their beauty and enjoy them in your garden, I will send you my "Surprise" package prepaid for $1.10. Contains ten varieties—no two alike—but not labeled. If under names this collection would cost at least $3.00. Do not send stamps.

Send for my free catalog, illustrated in colors and giving my personal cultural directions, making it easy to grow gladioli. Write for a copy *now*.

A. E. KUNDERD
Box 62, Goshen, Ind. U. S. A.
The Originator of
The Ruffled and the Laciniated Gladioli



Hardwick design School, Elizabethan

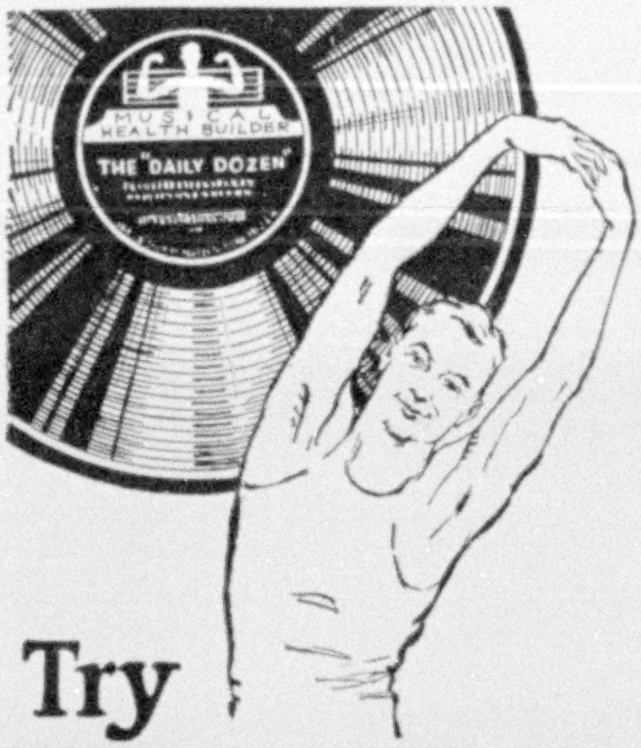
THAT hardware for your home—once looked upon merely as part of the "working equipment" of a house—can be made a vital part of the decorative scheme has been ably demonstrated by Russwin artisans who create the beautiful designs for Russwin Hardware.

For more than eighty years the name Russwin has been a guarantee of security, trouble-free service and unrivalled beauty of design.

And these features, which have led to its installation in many of America's finest buildings, make Russwin pre-eminently the hardware for your home.

"To Russwin-ize is to Economize—
The Economy of the Best."

Russell & Erwin Manufacturing Co.
The American Hardware Corporation
Successor
New Britain, Connecticut
New York Chicago San Francisco London



Try Walter Camp's DAILY DOZEN

At Our Risk *FREE!*

IN just TEN MINUTES A DAY you can keep perfectly fit for work or play! Walter Camp made it possible with his remarkable "Daily Dozen." Now the addition of lively phonograph music has made it easy as dancing. Joyful as following a parade. And far more beneficial than weight-lifting or strenuous gymnastics. Mr. Camp spent years developing these scientifically body-building exercises. They were adopted by the U. S. Army and Navy during the war. Now thousands of busy people everywhere use them to keep in the very pink of condition. Without tiring you, they limber your trunk muscles, expand your lungs, and speed up your circulation. Headaches and other minor ailments disappear. You work better because you feel better!

5 Days' Free Trial

Hundreds of sets of Daily Dozen records have been sold simply on Mr. Camp's recommendation. But now you have a chance to prove what this remarkable system will do for you—on five days' free trial. Send no money. Just the coupon. You get the entire regular outfit—5 full-size double-disc records containing all the music; a booklet with 60 photographs that illustrate the movements, and a handsome record album. Play the records—go through the easy exercises—see for yourself why so many people are delighted. Then decide whether you, too, need this aid to daily health. If you want to keep the Daily Dozen to Music, send $2.50 as first payment and $2 a month for 4 months. Total cost only $10.50. And you buy a **guarantee of keeping fit.** If you don't want the records return them, and you are out nothing. But don't delay. Send the coupon at once. This free trial offer will cause a heavy run on the supply of records! Don't set too late. Mail the coupon now.

FREE TRIAL COUPON

Health Builders, Inc., Dept. 183,
334 Fifth Ave., New York:

Please send me for five days' Free Trial at your expense the complete Health Builder series containing Walter Camp's entire Daily Dozen on five double-disc ten-inch records, the book of 60 actual photographs, and the beautiful record album. If for any reason I am not satisfied with the system, I may return it to you and will owe you nothing. But if I decide to keep it, I will send you $2.50 in five days (as the first payment) and agree to pay $2 a month for four months, until the total of $10.50 is paid.

Name..
(Please write plainly.)

Address...

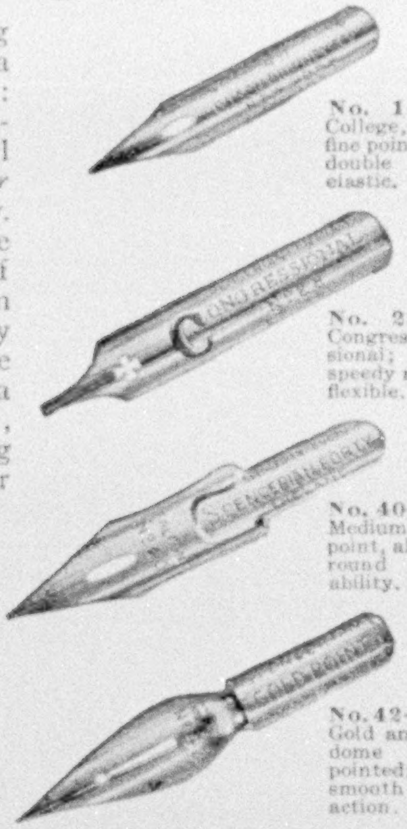
If you prefer to take advantage of our cash price, send only $10.00.
(Orders from outside U. S. are payable cash in full with the order.)

Spencerian *Personal* Steel Pens

When buying pens—here's a point to remember: There's a Spencerian Personal Steel Pen to fit *your* hand, perfectly. Every one of the many styles is of special Spencerian steel with finely worked, hand-made points. Result—a longer-lasting, smoother-writing pen than you ever used before.

SPENCERIAN
PEN CO.
349 Broadway
New York

A sample card of one dozen assorted pens for a dime and our handwriting booklet free.



No. 1—College, fine point, double elastic.

No. 28—Congressional; speedy and flexible.

No. 40—Medium point, all-round ability.

No. 42—Gold and dome pointed; smooth action.

A 30-day Gates Tour to Europe Costs you only $425

THIS sum includes all traveling, living and sightseeing expenses. An unusual opportunity for you to see, at moderate cost, all that the Old World offers—the capitals, ancient cities, famous museums, and places where history was made. And you travel under the most competent guidance. Gates Tours are planned by skilled experts with over 30 years of successful experience.

On a Gates Tour you have practically all the adantages of a private tour combined with the benefits of the utmost in travel experience. You avoid all the troublesome details of travel.

Write to-day for booklet A-3, sailings from May to September with a range of tours from 30 to 80 days, costing from $425 to $1100.

GATES TOURS—Founded 1892
"World Travel at Moderate cost"
225 Fifth Avenue, New York
London Paris Rome

CONARD STAR ROSES

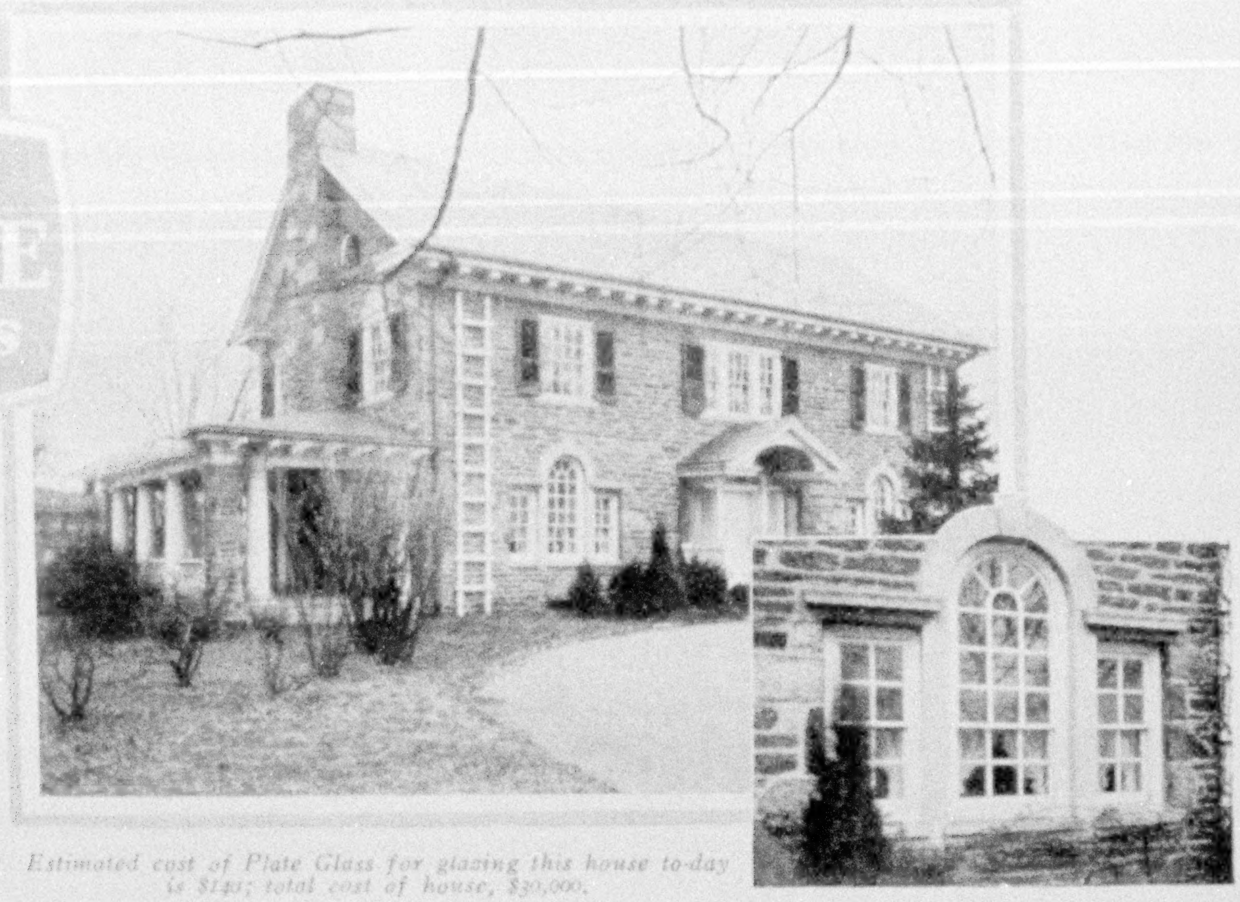
are so much better than most other roses that we guarantee them to bloom or refund your money. We also put a durable white star label with our name and the name of the rose on every Star Rose plant as the sign of that quality which enables us to make this *remarkable guarantee.* The Conard Star tag in any rose garden is a mark of superior quality—at no greater cost to you. Send today for the 54-page illustrated catalog FREE.

CONARD & JONES CO.,
Robt. Pyle, Pres.
Rose Specialists Box 8, West Grove, Pa.

Guaranteed to Bloom

Use
PLATE
Glass

Nothing else
is like it



Estimated cost of Plate Glass for glazing this house to-day is $141; total cost of house, $30,000.

©

Plate Glass adds beauty and value at little cost

There is a richness to Plate Glass which lends distinction to the house glazed with it. Its beautifully polished surfaces bring into the picture charming reflections of sky and foliage. A house glazed with Plate Glass stands out in striking contrast with its neighbors.

Yet Plate Glass costs less than is commonly supposed. Your architect can specify Plate Glass at very little additional cost. The cost of glazing with Plate Glass need not exceed one per cent of the total cost of the house. Its cost is more than compensated by the increased value of the house. Plate Glass is frequently the deciding factor in renting or selling.

PLATE GLASS MANUFACTURERS *of* AMERICA

Genuine
PLATE GLASS
MADE
in
U.S.A.

This Coupon Saved Us

25% to 40% on Fuel

Send It

Chamberlin Metal Weather Strips seal out cold, stop draughts, and end fuel waste. They save 25% to 40% on your heating bills. They insure even heat. Keep all parts of the house warm. No more cold spots. No dangerous draughts. The small cost will surprise you,—pays for itself in fuel saved.

And think of the comfort they give—the protection against dust, dirt, and soot constantly sifting in. Furnishings are saved from soilure. More than 12,000,000 doors and windows are Chamberlin equipped.

A Warm House When You Arise

Chamberlin Inside Door Bottoms enable you to admit fresh air to any part of the house while sealing all other parts against draughts. Thus when you sleep with open windows the other part of the house is not chilled. Inexpensive to install, separately or in conjunction with Chamberlin Metal Weather Strips. Just send the coupon.

Chamberlin Metal Weather Strip Co., Detroit, Mich.

I would like an estimate covering the cost of installing (check which) Chamberlin Inside Door Bottoms—Chamberlin Metal Weather Strips—In my Home—Office Building—Church—Number of Windows—Number of Doors—

Name ....

Address ....

City and State ....

Eng. Dept. A-8

Used on the lawns of the State Capitol—Salt Lake City, Utah.

A Real Power Grass Cutter

The Moto-Mower will keep your lawn looking its best. In tight places or out in the open it gives the same uniform workmanlike performance. It is fast, practical and economical for both large and small areas.

The Moto-Mower is sturdy, compact and fool-proof—anyone can operate it with ease.

Send for full information and prices

The Moto-Mower Co.
3344 E. Woodbridge St.
Detroit Michigan

Shining in its snowy whiteness is the toilet bowl cleaned with Sani-Flush. Stains vanish, without scrubbing. No hard work. Simply sprinkle Sani-Flush into the bowl, follow directions on the can, and flush.

Nothing else can reach the hidden, unhealthful trap and make it clean and sanitary. Sani-Flush destroys all foul odors. It will not harm plumbing connections. Always keep it handy.

If not at your grocery, drug or hardware store, send 25c for a full-size can.

THE HYGIENIC PRODUCTS CO.
Canton, Ohio

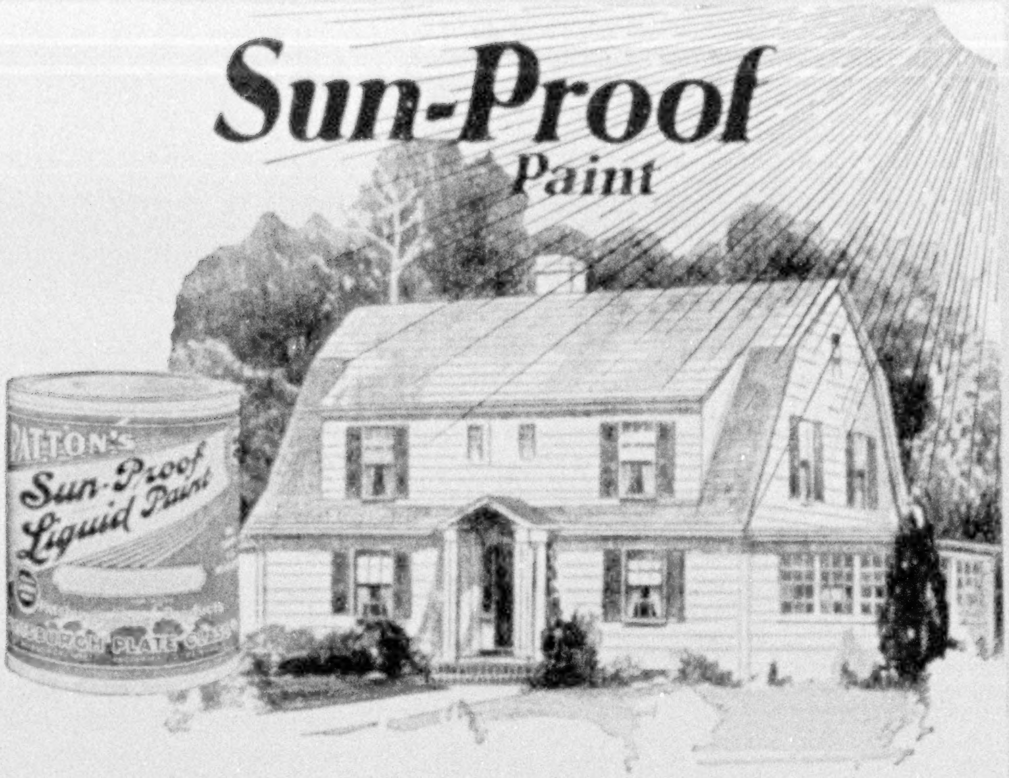
Sani-Flush

Reg. U.S. Pat. Off.

Cleans Closet Bowls Without Scouring

Paint

Sun-Proof
Paint



Every home is weather beaten

BUT only some of them show it. It all depends on the paint! The sun's burning rays blister and burn poor paint. Rain and the moisture creep in the crevices. Soon decay and rot have started their work.

The home that is painted with Sun-Proof Paint is protected. The non-porous coat of Sun-Proof Paint contracts and expands under the sun's heat and winter's cold. It will not blister. Sun-Proof covers an unusually large surface per gallon.

Sun-Proof is a "Pittsburgh Proof Product." Velumina, the wall paint you can wash, Pitcairn Waterspar Varnish, Banzai Enamel and many other famous "Pittsburgh Proof Products" lead because of the same high quality. Whatever you need in glass, paint, brushes or varnish there is a "Pittsburgh Proof Product" that will fill your requirements exactly. For sale by quality dealers everywhere. The Advisory Board helps manufacturers solve unusual paint and varnish problems.

Good paint is worth a good brush

Are you planning new hangings for the living-room? Send for the book "What to do and How to do it"—a guide to better homes. It answers scores of questions on home decoration and arrangement that crop up every day. Send ten cents to Dept. C, Pittsburgh Plate Glass Company, Milwaukee, Wis.

PITTSBURGH PLATE GLASS CO.

GLASS ~ Manufacturers ~ PAINT

Paint and Varnish Factories
Milwaukee, Wis. - Newark, N.J.

Varnish

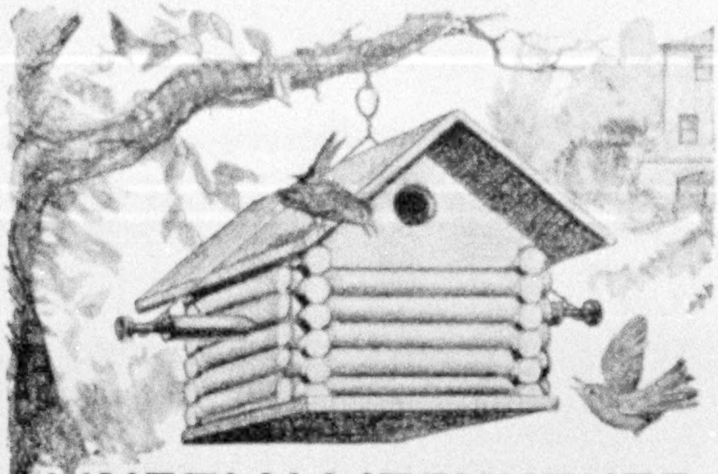
Beautiful TILES

Richness of texture—appropriateness of color—the achievement of combinations that are exactly proper: These are among the advantages of Tiles for those parts of the house where decorative values must be considered along with service.

Permanence of Tiles, and the ease with which they are kept in perfect condition, make them practical. Study the possibilities of Tiles for use in your home.

Consult your architect and dealer about Tiles, or write to

Associated Tile Manufacturers
350 7th Avenue, Beaver Falls, Pa.



LINCOLN WRENHOUSE

Price $1.00 delivered—four for $3.50

Invite a family of these little feathered friends to be your guests for the summer. Enjoy their songs. This bird house is artistic and practical, designed by the makers of the famous Lincoln Logs. Made of wood tinted a soft brown that attracts the birds. It comes *knocked down* and is easily put together.

JOHN LLOYD WRIGHT, Inc.
224 - EAST - ERIE - STREET, CHICAGO

Please mail............ Wren-houses, for which I enclose herewith............................

Name ....

Street ....

City .... State ....

Money back if not satisfied.

DUES

Annual membership in U. S., $3.00; annual membership abroad, $4.00; Canada, $3.50; life membership, $100. Please make remittances payable to the National Geographic Society, and if at a distance remit by New York draft, postal or express order.

RECOMMENDATION FOR MEMBERSHIP

IN THE

NATIONAL GEOGRAPHIC SOCIETY

The Membership Fee Includes Subscription to the National Geographic Magazine

PLEASE DETACH AND FILL IN BLANK BELOW AND SEND TO THE SECRETARY

....192

To the Secretary, National Geographic Society,
Sixteenth and M Streets Northwest, Washington, D. C.:

I nominate ....

Occupation ....
(This information is important for the records.)

Address ....

....

for membership in the Society.

....

....
Name and Address of Nominating Member

3-24

QUIET
SI-WEL-CLO
$97.50

THE TRENTON POTTERIES COMPANY
TEPECO
TRENTON, N.J. U.S.A.

A NOISY closet may be a source of untold embarrassment; all the greater because borne in silence. In the Quiet Si-wel-clo, the Trenton Potteries Company have accomplished the maximum of utility plus the advantage of exceptionally quiet operation. It adds so little to the plumbing investment and so much to the character of your bathroom that good judgment dictates its selection

Write for our free book
"Bathrooms of Character" S-4

THE TRENTON POTTERIES COMPANY
TRENTON, N. J., U. S. A.
New York Boston San Francisco

"Tepeco" makes, on a quality basis, other good closets at a price range to fit every purse.

"Welling"	$60.50
"Merit"	51.00
"Saxon"	45.50

F. O. B. Trenton

TEPECO Water Closets
FOR EVERY PLACE AND PURSE

Keep your back numbers serviceable and complete—a pride to any home. A record is kept of every binding and can be duplicated each year.

Bind Your Geographics

the right way—the right kind of sewing to give the strength and flexibility to permit flat opening. This is the way I have bound them for thousands of subscribers, in almost every State. I can supply missing numbers. Bind all other periodicals and complete libraries. *All work guaranteed.*
Send for booklet describing styles and prices.

H. KAUFMAN
Library
Bookbinder
Established 1903
306 E. 59th Street,
New York City

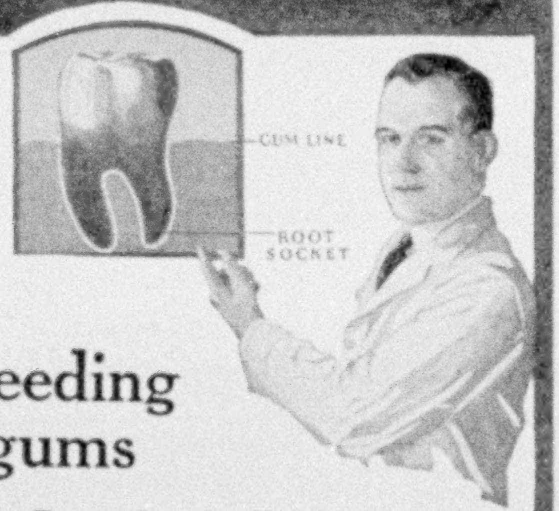
Whatever Your Question;—be it the pronunciation of **Fascista**, the spelling of a puzzling word, the location of **Esthonia** the meaning of **soviet, realtor, vitamin**, etc., this **Supreme Authority**—

WEBSTER'S NEW INTERNATIONAL DICTIONARY

contains an accurate, final answer. 407,000 Words 2700 Pages 6000 Illustrations.
Regular and India-Paper Editions
G. & C. MERRIAM CO., Springfield, Mass.
Write for specimen pages, prices, etc. and FREE Pocket Maps per Natl. Geo.

PYORRHOCIDE POWDER

keeps the gums healthy



Bleeding gums

Pyorrhea's flash of danger to the root sockets

PYORRHEA works *under the gum line* where you cannot see it. From the gum tissue, the infection spreads to the root sockets which hold your teeth in place. Then the teeth usually loosen and fall out—or must be pulled—because their support is weakened.

Dental clinics since 1908 have proved the effectiveness of Pyorrhocide Powder as an aid in *correcting*, as well as in *preventing*, pyorrhea. It is medicated with Dentinol, a gum-tissue healing agent used by the dental profession in the treatment of pyorrhea at the dentist's chair.

Pyorrhocide Powder keeps the teeth white and clean. It has a tonic and healing effect upon the gums. It corrects bleeding gums—strengthens tender gums—hardens soft gums. It helps healthy gums to *keep* healthy.

Use this dentifrice daily—see your dentist regularly—and you can avoid pyorrhea. The economical dollar package contains six months' supply. At all druggists.

FREE SAMPLE

Write for free sample and booklet on causes, effects, and prevention of pyorrhea.

PYORRHOCIDE
POWDER
PYORRHEA
SOFT BLEEDING SPONGY RECEDING GUMS
THE DENTINOL & PYORRHOCIDE CO.

The Dentinol &
Pyorrhocide Co., Inc.
Sole Distributors
1478 Broadway
New York City

Plant More Lilacs

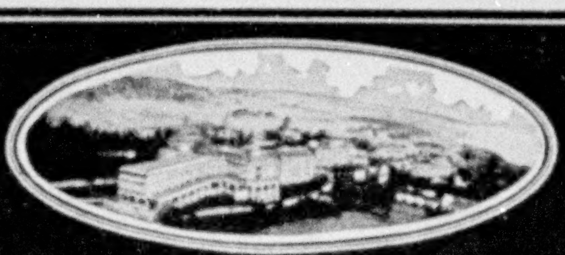
LILAC DAY

Is an annual event in Highland Park and Rochester. Thousands come from far and near and a special excursion from Canada is run every year. It would be interesting to know just how many have seen and admired this great collection of Lilacs, the largest in this country and one of the largest in the world, surpassing that in the famous Arnold Arboretum and rivaling that at Nancy, France.

Our beautiful **Catalogue** and **Planting Guide** will tell you more about **Rochester Lilacs,** also Fruit, Nut and Ornamental Trees, Roses, Shrubs, Vines, Evergreens, Perennial Plants, etc. Send us your name and we will send you a copy of this book postpaid.

JUST ASK FOR CATALOGUE "N"

GLEN BROTHERS, Inc.
GLENWOOD NURSERY
ROCHESTER, N. Y.
"Famous Since the Sixties"



THE GLEN SPRINGS

WATKINS GLEN, N. Y., ON SENECA LAKE
Open All The Year. Wm. E. Leffingwell, Pres.
A Mineral Springs Health Resort and Hotel. The Pioneer American "cure" for heart disorders.

Travel Pictures For Home Decoration

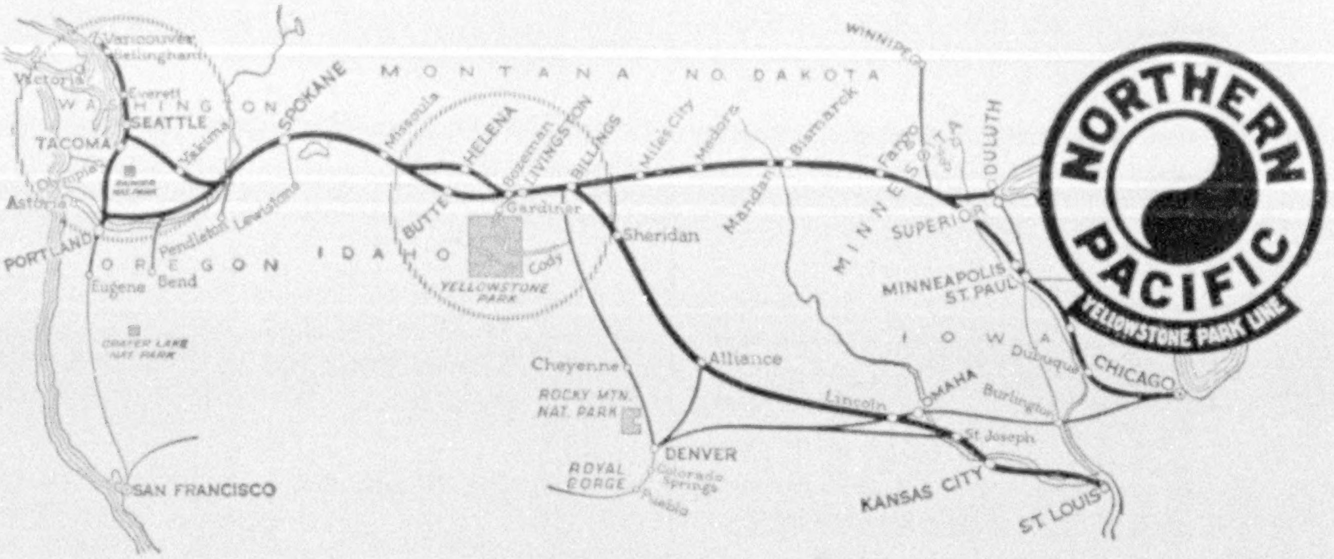
Brighten up the living room, the parlor, library or den by filling the walls with pictures, photographs, and maps. It is easy to hang pictures, small or large, without injuring wall-paper plaster, or wood-work, when you use

Moore Push-Pins
"Glass Heads—Steel Points"

Moore Push-less Hangers
"The Hanger with the Twist"

10c. pkts. Sold everywhere. In Canada, 15c.

MOORE PUSH-PIN CO.
(Wayne Junction) Philadelphia, Pa.


Vancouver
Bellingham
Victoria
Everett
WASHINGTON
SEATTLE
TACOMA
Olympia
RAINIER NAT. PARK
Astoria
Yakima
SPOKANE
PORTLAND
Pendleton
Lewiston
OREGON
Eugene
Bend
CRATER LAKE NAT. PARK
SAN FRANCISCO
IDAHO
MONTANA
Missoula
BUTTE
HELENA
Bozeman
LIVINGSTON
Gardiner
BILLINGS
Cody
YELLOWSTONE PARK
Miles City
Medora
Sheridan
Cheyenne
ROCKY MTN. NAT. PARK
DENVER
ROYAL GORGE
Colorado Springs
Pueblo
NO DAKOTA
Mandan
Bismarck
Alliance
WINNIPEG
Fargo
MINNESOTA
DULUTH
SUPERIOR
MINNEAPOLIS
ST. PAUL
IOWA
Dubuque
CHICAGO
Lincoln
OMAHA
Burlington
St Joseph
KANSAS CITY
ST LOUIS
NORTHERN PACIFIC
YELLOWSTONE PARK LINE

Fill Out the Coupon

*"We'll do the rest"**

Mr. A. B. Smith, Pass. Traffic Mgr.,
941 Northern Pacific Bldg., St. Paul, Minn.

Dear Mr. Smith:

This summer, I expect to spend my vacation in the Pacific Northwest, leaving here..............................and getting back..............................

Will you please outline for me a trip that will include:
(Check— √ —cities, or resorts in which you are particularly interested.)

The Minnesota Lakes
Helena
Montana Rockies
Seattle—Alaska
Portland
Yellowstone Park
Flathead Lake Country
Tacoma
Butte
Spokane
Rainier National Park
Colorado

The purpose of my trip is primarily:
(*Check*) √ Pleasure Health Sight-seeing Business All Four
but I should also like to see something of these phases of Western life:
(*Check*) √ Mining Irrigation Fruit-raising Cowboys Lumbering Indians Wild Animals
I prefer to spend a good part of my vacation:
(*Check*) √ Fishing Camping Out In the Mountains Golfing Beside the Sea In Cities In Yellowstone and Rainier Parks

I understand that, this summer, the Northern Pacific will offer exceedingly low rates to Yellowstone Park and the Pacific Northwest. Please tell me what a ticket will cost from..............................to.............................. and return.

I understand, too, that all your through trains are equipped with observation cars and that your dining car service has the reputation of being the most satisfactory of any western railroad. Give me, please, details of these features of your service.

Name..............................

Street and No..............................

City and State..............................

*Your vacation should be the happiest experience of the year.
Let me help you make it so. A. B. Smith.

Northern Pacific Ry.

"2000 Miles of Startling Beauty"

AMERICAN STATIONERY

The leading household note paper—used in better homes everywhere. Made from National Bank Bond—a superior paper. Neatly printed in rich, dark blue ink. Size of sheets 6 x 7; envelopes to match. To handle our enormous volume of business with dispatch the U. S. Goverment has established a branch Post Office in our plant. Remit with order—or, if inconvenient at the moment, we will ship C. O. D. West of Denver and outside of U. S. add 10%.

THE AMERICAN STATIONERY CO.
303 Park Avenue Peru, Indiana

200 *Sheets*
100 *Envelopes*

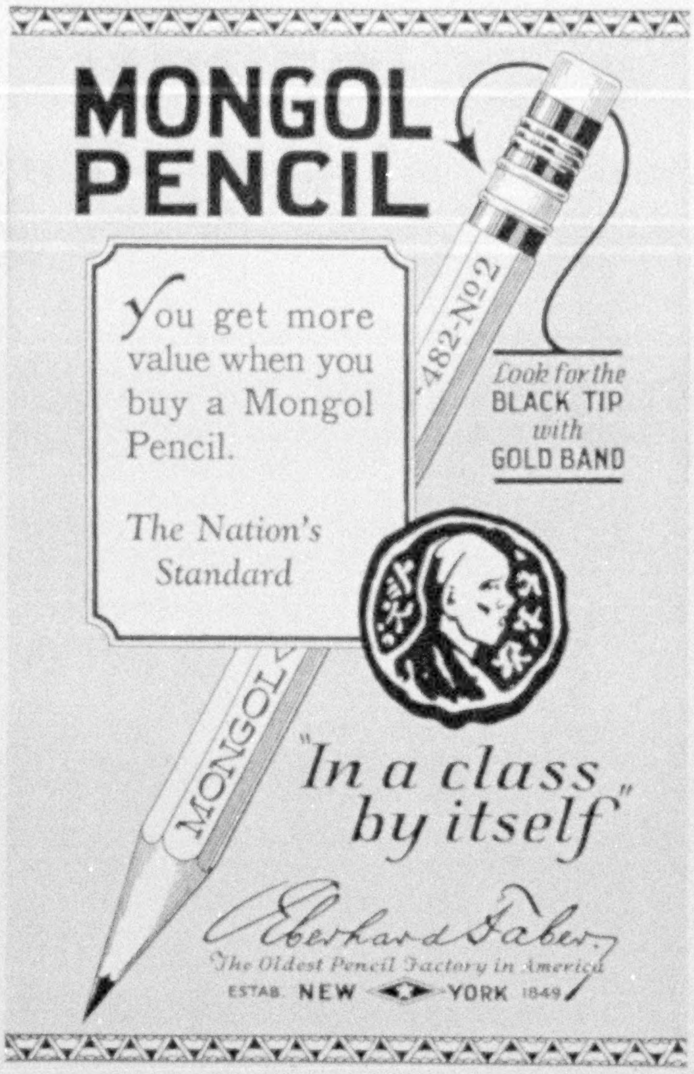
PRINTED WITH ANY NAME AND ADDRESS

$1.00 POSTPAID

THE AMERICAN STATIONERY CO.,
303 Park Avenue, Peru, Indiana

Send me a pack of 200 sheets and 100 envelopes of American Stationery to be printed as shown on attached slip. (Note: To avoid errors, write or print copy plainly.)

MONEY REFUNDED IF YOU ARE NOT WHOLLY SATISFIED



MONGOL PENCIL

You get more value when you buy a Mongol Pencil.

The Nation's Standard

Look for the BLACK TIP *with* GOLD BAND

"*In a class by itself*"

Eberhard Faber
The Oldest Pencil Factory in America
ESTAB. NEW YORK 1849

EXPRESSIVE MEMORIALS

For memorials that symbolize the noble traits of character of the loved ones they commemorate, there are none that surpass the quality products of the Harrison Granite Company. Our long experience assures you of satisfaction.

Write for Booklet C

HARRISON GRANITE COMPANY, Inc.
Established 1845
200 Fifth Avenue New York

200 Sheets — 100 Envelopes

$1.00 Postage Prepaid

High grade, clear, white bond paper — unusually smooth writing surface. Size 6 x 7 inches with envelopes to match. We give you much superior quality stationery at this low price as we sell this item only. Special handy box keeps paper and envelopes in order and easily reached, preventing waste.

Your Name and Address Printed FREE
on every sheet and envelope, in rich dark blue, up to 4 lines. (Note—our low price does not allow any variation in printing. Top center of sheet and flap of envelope only). Type is Plate Gothic, designed especially for clearness and good taste. Makes a personal stationery you will be delighted to use. An ideal gift printed with your friend's name.

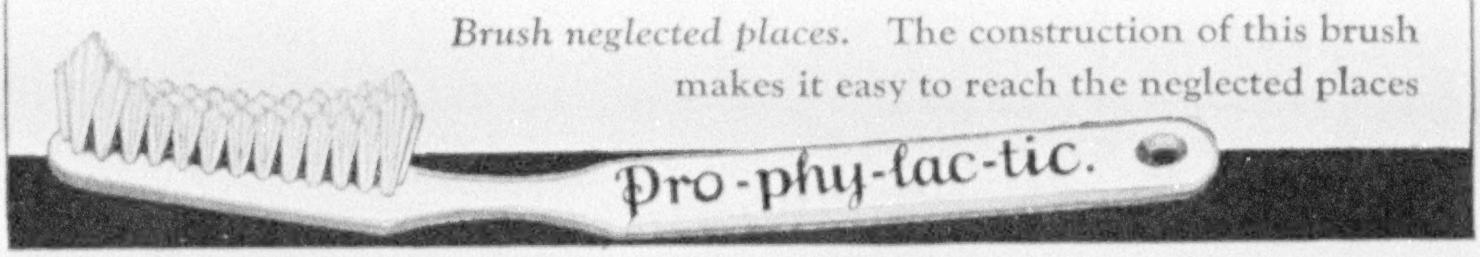
Just send your name and address (write or **print** clearly) with $1.00 (west of Denver and outside the U. S. $1.10) and this generous box of stationery will come to you neatly packed, postage prepaid. Money returned if you are not more than satisfied. Order today!

National Stationery Co.
1553 Lincoln Highway
Batavia, Illinois

THIS MAGAZINE IS FROM OUR PRESSES

JUDD & DETWEILER, INC.
Master Printers

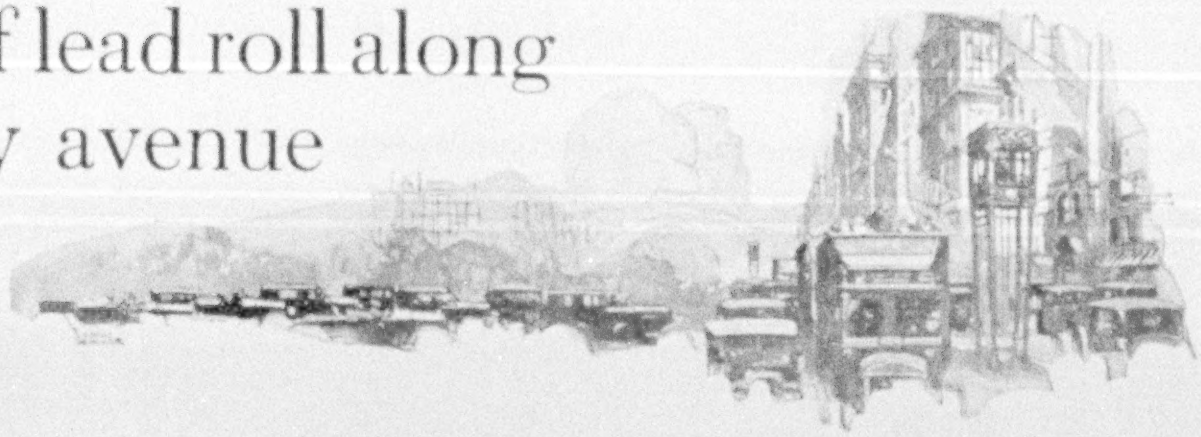
ECKINGTON PLACE AND FLORIDA AVENUE WASHINGTON, D. C.



Brush neglected places. The construction of this brush makes it easy to reach the neglected places

Pro-phy-lac-tic.

Tons of lead roll along every avenue



HOW much lead is in your automobile? In all the new motor vehicles built in a year, there are about 109,000,000 pounds of lead.

The storage battery that provides electric power for automobile lights, starter, and ignition is mostly lead. It consists of lead plates, every other one covered with litharge and the rest with red-lead. Both litharge and red-lead are obtained from metallic lead.

Remember that if it were not for lead-tin solder, the seams of the gasoline tank would leak. The same kind of solder seals your radiator and holds in place the windings of wire in the generator that charges the lead storage battery.

Every time you turn a hard-rubber switch button on your instrument board you touch something that contains lead. When you adjust the wiring about your motor, fingers grasp its soft rubber insulation, which also has lead in it. The rubber tires, rubber top, and the rubber mat on the car step contain lead. The electric light bulbs are made of lead glass.

To all this lead we must add the litharge that helps refine more than 4,500,000,000 gallons of gasoline for motor fuel each year.

Where you find the most lead

OF even greater importance, so far as tonnage goes, than the use of lead by the automobile manufacturer is the lead that you use in general painting. In one year approximately 350,000,000 pounds of white-lead are used on surfaces such as wood.

"Save the surface and you save all"—Paint & Varnish

That record reflects the awakening of property owners to the necessity of paint protection. More of these owners than ever before believe today in the truth of the phrase, "Save the surface and you save all."

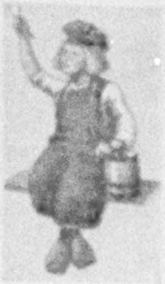
Producers of lead products

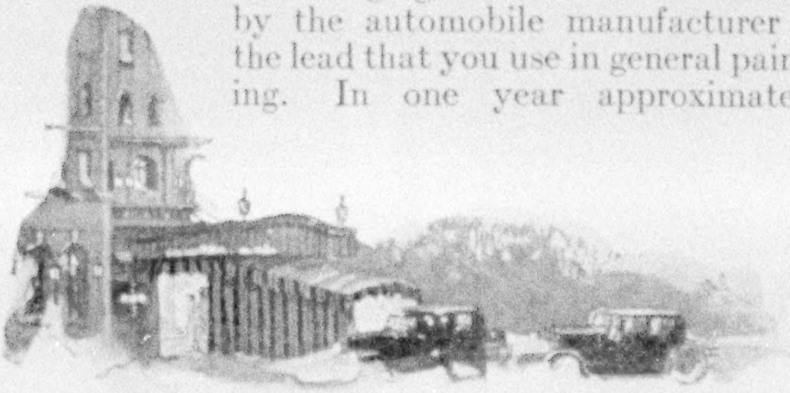
Dutch Boy white-lead is the name of the pure white-lead made and sold by National Lead Company. On every keg of *Dutch Boy white-lead* is reproduced the picture of the Dutch Boy Painter shown below. This trademark guarantees a product of the highest quality.

Dutch Boy products also include red-lead, linseed oil, flatting oil, babbitt metals, and solder.

National Lead Company also makes lead products for practically every purpose to which lead can be put in art, industry, and daily life. If you want information regarding any particular use of lead, write to us.

If you wish to read further about this wonder metal, we can tell you of a number of interesting books on the subject. The latest and probably the most complete story of lead and its many uses is "Lead, the Precious Metal," published by the Century Company, New York. If you are unable to get it at your bookstore, write us or the publishers.





NATIONAL LEAD COMPANY

New York, 111 Broadway; Boston, 131 State St.; Buffalo, 116 Oak St.; Chicago, 900 West 18th St.; Cincinnati, 659 Freeman Ave.; Cleveland, 820 West Superior Ave.; St. Louis, 722 Chestnut St.; San Francisco, 485 California St.; Pittsburgh, National Lead & Oil Co. of Pa., 316 Fourth Ave.; Philadelphia, John T. Lewis & Bros. Co., 437 Chestnut St.

Formula of
R.J. Forhan DDS
Forhan Company
New York
Forhan's
TRADE MARK
FOR
THE GUMS
"BRUSH YOUR TEETH
WITH IT"
FORMULA OF
R.J. Forhan, D.D.S.
Specialist in
DISEASES OF THE MOUTH
PREPARED FOR THE
PRESCRIPTION OF THE
DENTAL PROFESSION

Where one is safe, Four others pay

Don't pay Pyorrhea's price—
Brush your teeth with Forhan's

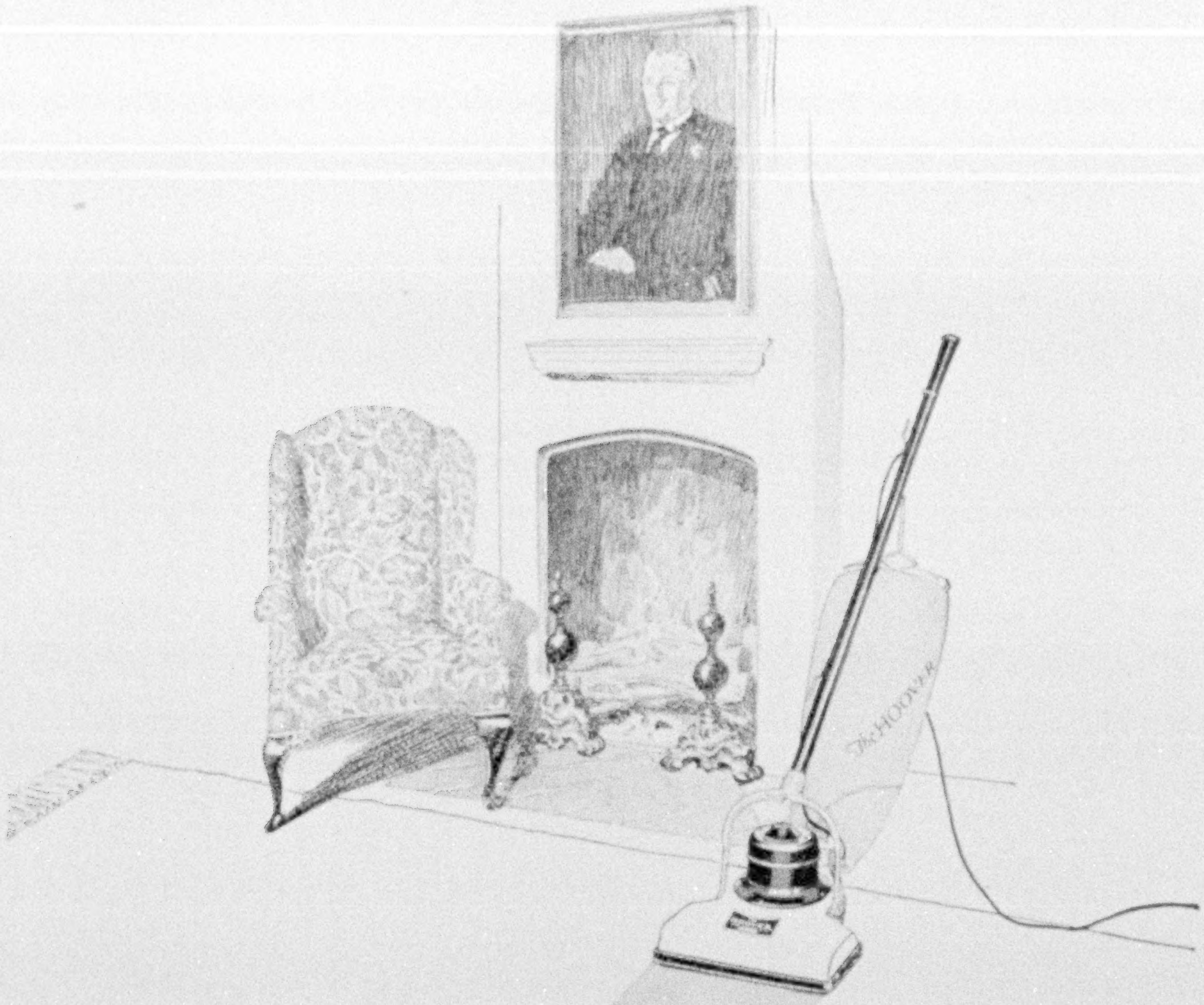
Every man and woman is in danger of Pyorrhea. According to reliable dental statistics, four persons out of every five past 40, and thousands younger, too, are victims of this disease.

Are you willing to pay the penalty—lost teeth and shattered health? If not, don't neglect your teeth. Visit your dentist regularly for tooth and gum inspection, and make Forhan's For the Gums *your* dentifrice. It is most pleasant to the taste.

Forhan's For the Gums, if used in time and used consistently, will help prevent Pyorrhea or check its course, keep the gums firm, the teeth white, the mouth healthy. At all druggists, 35c and 60c.

Forhan's

FOR THE GUMS



DIRT in a home may be a woman's *problem*, but it's a man's *responsibility*. For it will cease to be there when he supplies her with efficient means to remove it. Regularly, she sweeps and dusts; she spares no effort. But most of the dirt is beyond her reach with a broom. It is embedded, packed down deep in the nap of the rugs. It is the dirt that *only beating will dislodge*. And without a Hoover she can't beat rugs regularly, and often. For what electric suction sweeper do you know of, other than The Hoover, that "BEATS...as it Sweeps, as it Cleans?" Until she owns a Hoover your rugs will be a hiding place for dirt. And it's the dirt you both want most to be rid of. It's sharp-edged; it cuts rug nap. It's germ-laden, a constant source of disease. See that *your* rugs are beaten regularly like your neighbor's, who already owns a Hoover. It will be easy for you to buy *your* Hoover. Any Authorized Dealer will sell you the *new* model, with its ten added features, on such easy terms that paying for it is no problem at all.

THE HOOVER COMPANY, NORTH CANTON, OHIO
The oldest and largest makers of electric cleaners
The Hoover is also made in Canada, at Hamilton, Ontario

The HOOVER

It BEATS ... as it Sweeps as it Cleans

PRESS OF JUDD & DETWEILER, INC
WASHINGTON, D. C.

An Offer That May Never Be Made Again

Why we have been willing to lose money on this introductory offer—and why it must soon be withdrawn

HERE is one of those rare bargains you are offered only once in *months*.

And this may be the *last time* it will ever be offered.

We have been willing to lose money on it, for the very interesting reason explained below. Our loss, however, is *your gain*.

On this offer you are given a pair of Abraham Lincoln Book-Ends, ABSOLUTELY FREE. These book-ends are made of heavy bronzed metal, with Lincoln's head in bas-relief. They are an adornment to any library table. They would cost, if obtainable in stores, $1.00 to $1.50.

Yet they are given free—in order to introduce the NEW set of thirty Little Leather Library world's masterpieces.

We know what has happened in the past on our previous sets after they were introduced—*orders poured in by the thousands.*

The wisest thing we could do, therefore, was to introduce this NEW set QUICKLY into representative homes. We know what will happen after this is done. Every set will become a "silent salesman," more powerful than any other form of advertising we could do.

That is the reason—the only reason—we have been willing to lose money on this offer.

This NEW set is, in many respects, the finest we have ever published. It includes the *best works*, each one complete, of such famous authors as:

Barrie
Kipling
Shaw
Yeats
Allen
Balzac
Browning
Eliz. Browning
Dumas
Emerson
Whitman
Whittier
Poe
Irving
Ibsen
Shakespeare
Lamb
Moore
Tennyson
Plato
Wilde
Maeterlinck
Turgenev
Longfellow
Dante
Elbert Hubbard

These thirty volumes, *without* the book-ends, have been valued (by hundreds of people who were asked to guess) *at from five to fifteen times their price.* Each volume is complete. The binding is a beautiful limp Croftcott, handsomely embossed, and tinted an antique copper and green, so that even experts have mistaken it for hand-tooled leather. *The paper is actually the same quality as that used in books that sell regularly for $2.00 apiece.* Yet the price, for *all thirty* volumes, is only $2.98.

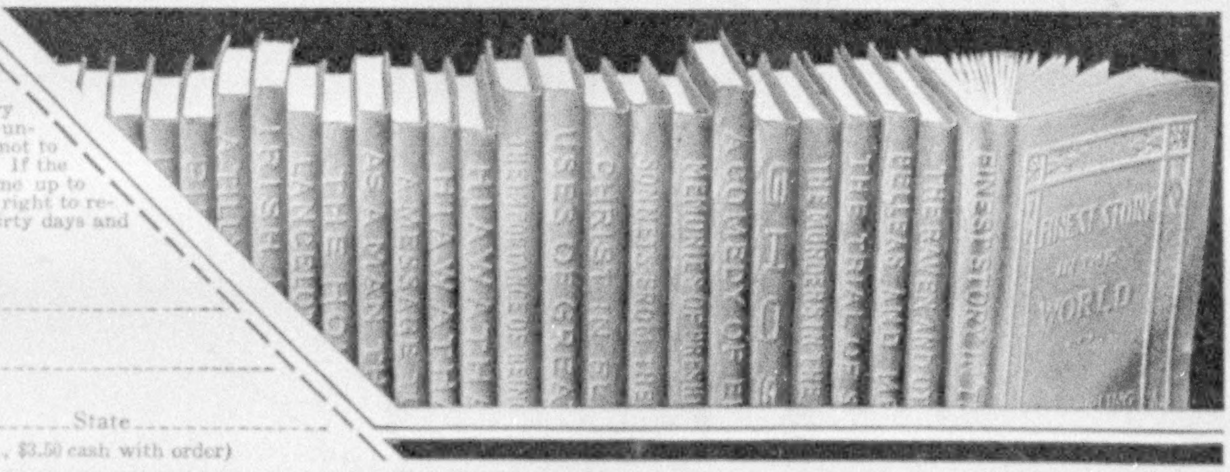
How can *thirty such books* be sold for only $2.98? Simply by printing in editions of *at least one million books at a time,* relying on the good taste of the public to keep the enterprise self-sustaining. Quantity production—that is the whole secret.

Surely, sooner or later, you will want to obtain this wonderful set—at least a year's good reading for the price of a theater ticket! Why, then, not obtain it at once, taking advantage of the exceptional "premium" now offered for introductory purposes only?

Sent for Thirty Days' Examination

Do not send any money. Simply mail the coupon or a letter mentioning this advertisement. When the books and book-ends arrive, give the postman only $2.98, plus the few pennies for delivery charges. Then, if you wish, examine the books for thirty days. If you are disappointed in the slightest respect, if you do not agree that this is one of the most satisfactory purchases you have ever made, send the set back any time within the thirty days, and your money will instantly be refunded. Can a fairer offer be made? References: Manufacturers' Trust Company, or any magazine. NOTE: When the present supply of book-ends is gone this offer will be withdrawn. It is made for introductory purposes only. If you want to take advantage of it, it is advisable NOT TO DELAY. Mail coupon or letter at once.

Little Leather Library Corporation
Dept. 123
218 West 40th Street New York, N. Y.



Little Leather Library Corp., Dept. 123, 218 West 40th Street, New York City:

Please send me the new set of 30 volumes of the Little Leather Library, and a pair of Lincoln Bas-Relief Book-Ends *free*. I will pay the postman $2.98 plus the few cents delivery charges upon arrival. It is understood, however, that this is not to be considered as a purchase. If the books do not in every way come up to my expectation, I reserve the right to return them any time within thirty days and you agree to return my money.

Name……………………………………

Address……………………………………

City……………………State……………

(Outside of U. S., $3.50 cash with order)